STIC Search Report
EIC 3700

STIC Database Tracking Number: 102526

TO:	From:
Mital Patel **Location: CP2, 3B30** **Art Unit: 3761** **Case Serial Number:** 10/035199	**Jeanne Horrigan** **Location: EIC 3700** **CP2-2C08** **Phone: 305-5934** **jeanne.horrigan@uspto.gov**

Search Notes

Attached are the search results for the mask fit test, including author and prior art searches in foreign and international patent databases, and prior art searches in medical and general sci/tech information in non-patent literature databases and on the Internet, through the Google and Scirus search engines.

Also attached is a search feedback form. Completion of the form is voluntary. Your completing this form would help us improve our search services.

I hope the attached information is useful. Please feel free to contact me (phone 305-5934 or email jeanne.horrigan@uspto.gov) if you have any questions or need additional searching on this application.

JH

STIC Search Results Feedback Form

EIC 3700

Questions about the scope or the results of the search? Contact ***the EIC searcher or contact:***

John Sims, EIC 3700 Team Leader
308-4836, CP2-2C08

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 3730*
- *Relevant prior art **found**, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

  Types of relevant prior art found:
  - ☐ Foreign Patent(s)
  - ☐ Non-Patent Literature
    (journal articles, conference proceedings, new product announcements etc.)
- *Relevant prior art **not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC3700 CP2 2C08

```
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200355
File 347:JAPIO Oct 1976-2003/Apr(Updated 030804)
File 371:French Patents 1961-2002/BOPI 200209
Set     Items   Description
S1          1   AU='BREWER G N'
S2          4   AU='COLLA G A'
S3          6   AU='FARRUGIA S' OR AU='FARRUGIA S P'
S4          1   AU='SOMAIYA C'
S5          8   AU='BREWER G'
S6          5   AU='COLLA G'
S7          1   (S1 OR S5) AND (S2 OR S6) AND S3 AND S4
S8          8   MASK()FIT
S9          0   (S1:S6 AND S8) NOT S7
S10    180482   MASK OR MASKS
S11         5   (S1:S6 AND S10) NOT S7

7/34/1     (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003  Thomson Derwent. All rts. reserv.
013303508    **Image available**
WPI Acc No: 2000-475443/200041
  Mask fit pressure determination method involves determining percentile
  pressure of previous ventilatory assistance session
Patent Assignee: RESMED LTD (RESM-N); BREWER G N (BREW-I); COLLA G A
  (COLL-I); FARRUGIA S P (FARR-I); SOMAIYA C (SOMA-I)
Inventor:  BREWER G N ;  COLLA G A ;  FARRUGIA S P ;  SOMAIYA C
Number of Countries: 091  Number of Patents: 008
Patent Family:
Patent No     Kind   Date     Applicat No    Kind   Date     Week
WO 200037135   A1  20000629  WO 99AU1130     A   19991221  200041  B
AU 200022683   A   20000712  AU 200022683    A   19991221  200048
AU 9965370     A   20001109  AU 9965370      A   19991221  200063
EP 1144036     A1  20011017  EP 99966774     A   19991221  200169
                             WO 99AU1130     A   19991221
US 20020056452  A1  20020516  US 99469954     A   19991221  200237
                             US 200235199    A   20020104
US 6425395     B1  20020730  US 99469954     A   19991221  200254
AU 750761      B   20020725  AU 9965370      A   19991221  200260
JP 2002532207  W   20021002  WO 99AU1130     A   19991221  200279
                             JP 2000589242   A   19991221
Priority Applications (No Type Date): AU 987831 A 19981221
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
WO 200037135  A1 E  21 A61M-016/06
   Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN
   CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
   KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE
   SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
   Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
   IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
AU 200022683  A        A61M-016/06   Based on patent WO 200037135
AU 9965370    A        A61M-016/06
EP 1144036    A1 E     A61M-016/06   Based on patent WO 200037135
   Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
   LI LT LU LV MC MK NL PT RO SE SI
US 20020056452 A1       A62B-007/00   Div ex application US 99469954
```

US 6425395 B1 A61M-016/00
AU 750761 B A61M-016/06 Previous Publ. patent AU 9965370
JP 2002532207 W 22 A61M-016/06 Based on patent WO 200037135
Abstract (Basic): WO 200037135 A1

NOVELTY - The mask fit pressure determination method involves determining percentile pressure of previous ventilatory assistance session. The determined percentile pressure is the test pressure chosen from range of 75th-95th percentile pressure.

DETAILED DESCRIPTION - The base pressure ranging from 10-12cm H2O, is set as test pressure when previous percentile pressure is not determined. When the pressure ventilatory assistance session is occurred for greater than predetermined time interval of three hours, the previous pressure is determined. INDEPENDENT CLAIMS are also included for the following:

(a) mask correct fitting assessing method;

(b) ventilatory assistance apparatus

USE - For determination of suitable pressure for fitting mask used for patients having obstructive sleep apnea (OSA) or other breathing disorders.

ADVANTAGE - The mask fit pressure is determined by previous percentile pressure by hence when mask fitted to patient, the leaks are prevented. The treatment efficacy depends on correct mask fitting.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic block diagram of continuous positive airway pressure apparatus describing mask fitting pressure determination method.

pp; 21 DwgNo 2/3

Derwent Class: P34; P35; S02; S05
International Patent Class (Main): A61M-016/00; A61M-016/06; A62B-007/00
International Patent Class (Additional): A62B-009/00

11/26,TI/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.
015493373
WPI Acc No: 2003-555520/200352
Continuous positive airway pressure treatment pressure administration method for treating sleep apnea syndrome, involves increasing pressure of air supplied to patient when detecting apnea

11/26,TI/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.
013204459
WPI Acc No: 2000-376332/200032
Fault detection in a continuous positive airway pressure device for the treatment of sleeping disorders such as obstructive sleep apnea using a controlled gas flow generator and delivery circuit with reduced costs and improved safety

11/26,TI/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.
012541139
WPI Acc No: 1999-347245/199929
Administering CPAP treatment for upper airway obstruction incidences e.g. sleep Apnea

11/26,TI/4 (Item 4 from file: 350)

DIALOG(R)File 350:Derwent WPIX

011224095
WPI Acc No: 1997-202020/199718

Continuous positive airway pressure treatment apparatus with pressure swing compensation - estimates flow from measured and closed valve pressures with square root of estimate used to linearise flow

11/26,TI/5 (Item 5 from file: 350)

DIALOG(R)File 350:Derwent WPIX

011130839
WPI Acc No: 1997-108763/199710

Auto-calibration of pressure transducer offset - determines if flow generator is operating and if transducer senses no pressure to accept transducer's pressure offset value as being atmospheric

File 348:EUROPEAN PATENTS 1978-2003/Aug W04
File 349:PCT FULLTEXT 1979-2002/UB=20030828,UT=20030821

Set	Items	Description
S1	2	AU='BREWER GREGORY NEWTON'
S2	6	AU='COLLA GREG' OR AU='COLLA GREGORY ALAN'
S3	6	AU='FARRUGIA STEVEN PAUL'
S4	2	AU='SOMAIYA CHINMAYEE'
S5	**2**	**S1 AND S2 AND S3 AND S4**
S6	**8**	**S1:S4 NOT S5**

5/3,AB/2 (Item 1 from file: 349) a duplicate of 7/34/1 page 1
DIALOG(R)File 349:PCT FULLTEXT

00573762
DETERMINATION OF MASK FITTING PRESSURE AND CORRECT MASK FIT
DETERMINATION DE LA PRESSION D'AJUSTEMENT D'UN MASQUE, ET AJUSTEMENT CORRECT DUDIT MASQUE
Patent Applicant/Assignee:
RESMED LIMITED,
BREWER Gregory Newton,
COLLA Gregory Alan,
FARRUGIA Steven Paul,
SOMAIYA Chinmayee,
Inventor(s):
BREWER Gregory Newton ,
COLLA Gregory Alan ,
FARRUGIA Steven Paul ,
SOMAIYA Chinmayee
Patent and Priority Information (Country, Number, Date):
Patent: WO 200037135 A1 20000629 (WO 0037135)
Application: WO 99AU1130 19991221 (PCT/WO AU9901130)
Priority Application: AU 987831 19981221
Designated States: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 4641
English Abstract

CPAP treatment apparatus (10), as one form of positive pressure ventilatory assistance, is disclosed. A turbine/blower (14), operated by a mechanically coupled electrical motor (16), receives air or breathable gas at an inlet (18) thereof, and supplies the breathable gas at a delivery pressure to a delivery tube/hose (20) having connection at the other end thereof with a nose mask (12). A microcontroller (38) has an operational "Mask-Fit" mode. An initial constant pressure level is applied by the blower (14) to the mask (12). If the functional mode is a Manual mode, then the mask-fit test pressure is the current 'set' pressure. If the functional mode is the Automatic Titration mode, the mask-fit test pressure is the 95th percentile pressure of the previous session, otherwise it is the base treatment pressure, e.g. 10-12 cm H2O. This constant pressure is applied for a period of time, typically 1-3 minutes. The microcontroller (38) continuously determines mask leak as the value, fLEAK, from a flow sensor (32), comparing this to a threshold,

and providing the patient with a visual indication of degree of leak. In this way the patient can manipulate the mask to ensure correct fitting as indicated by the appropriate message or indication.

6/6/2 (Item 2 from file: 348)
01057212
ADMINISTRATION OF CPAP TREATMENT PRESSURE IN PRESENCE OF APNEA

6/6/3 (Item 3 from file: 348)
00848391
FLOW ESTIMATION AND COMPENSATION OF FLOW-INDUCED PRESSURE SWINGS IN CPAP TREATMENT AND ASSISTED RESPIRATION

6/6/5 (Item 2 from file: 349)
00492747 **Image available**
ADMINISTRATION OF CPAP TREATMENT PRESSURE IN PRESENCE OF APNEA

6/6/6 (Item 3 from file: 349)
00369691 **Image available**
FLOW ESTIMATION AND COMPENSATION OF FLOW-INDUCED PRESSURE SWINGS IN CPAP TREATMENT AND ASSISTED RESPIRATION

6/6/7 (Item 4 from file: 349)
00361739 **Image available**
AUTO-CALIBRATION OF PRESSURE TRANSDUCER OFFSET

6/6/8 (Item 5 from file: 349)
00349542 **Image available**
MONITORING THE OCCURRENCE OF APNEIC AND HYPOPNEIC AROUSALS

6/3,AB/4 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
(c) 2003 WIPO/Univentio. All rts. reserv.
00564084
FAULT DIAGNOSIS IN CPAP AND NIPPV DEVICES
DIAGNOSTIC D'ANOMALIES DANS LES DISPOSITIFS DE VENTILATION SPONTANEE EN PRESSION POSITIVE CONTINUE (CPAP) ET DE VENTILATION NON INVASIVE EN PRESSION POSITIVE (NIPPV)
Patent Applicant/Assignee:
RESMED LTD,
COLLA Greg,
KENYON Barton,
Inventor(s):
COLLA Greg ,
KENYON Barton
Patent and Priority Information (Country, Number, Date):
Patent: WO 200027457 A1 20000518 (WO 0027457)
Application: WO 99AU972 19991105 (PCT/WO AU9900972)
Priority Application: AU 986933 19981105
Designated States: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English

Fulltext Word Count: 5343

English Abstract

A ventilation device for non-invasive positive pressure ventilation (NIPPV) or continuous positive airway pressure (CPAP) treatment of a patient has a gas flow generator (1, 2), a gas delivery circuit (5, 6) optionally including a humidifier (H), a controller (4) and sensors (10, 11, 12, 13, 14) monitoring values of operational parameters of the device. The device further includes one or more relationships stored in data storage of the controller relating combinations of parameter values as being indicative of fault conditions of the device operation, the sensors and/or the fault detection process.

File 155:MEDLINE(R) 1966-2003/Aug W5
File 5:Biosis Previews(R) 1969-2003/Aug W4
File 73:EMBASE 1974-2003/Aug W4
File 34:SciSearch(R) Cited Ref Sci 1990-2003/Aug W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

Set	Items	Description
S1	357	AU='BREWER G' OR AU='BREWER G N' OR AU='BREWER G.'
S2	2	AU='BREWER GREG' OR AU='BREWER GREGORY NEWTON'
S3	88	AU='COLLA G' OR AU='COLLA G.' OR AU='COLLA G-A' OR AU='COLLA GREGORY ALAN'
S4	11	AU='FARRUGIA S' OR AU='FARRUGIA S.' OR AU='FARRUGIA STEVEN PAUL'
S5	1	AU='SOMAIYA CHINMAYEE'
S6	50807	MASK OR MASKS
S7	1783020	PRESSURE
S8	3	S1:S5 AND S6(S)S7
S9	**2**	**RD (unique items)**

9/6/1 (Item 1 from file: 5)
14127874 BIOSIS NO.: 200300121903
Administration of CPAP treatment pressure in presence of apnea.
2003

9/7/2 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
(c) 2003 BIOSIS. All rts. reserv.
13848431 BIOSIS NO.: 200200477252
Determination of mask **fitting** pressure **and correct** mask **fit.**
AUTHOR: **Brewer Gregory Newton** (a); **Colla Gregory Alan** ; **Farrugia Steven Paul** ; **Somaiya Chinmayee**
AUTHOR ADDRESS: (a)Lewisham**Australia
JOURNAL: Official Gazette of the United States Patent and Trademark Office Patents 1260 (5):pNo Pagination July 30, 2002
MEDIUM: e-file
ISSN: 0098-1133
DOCUMENT TYPE: Patent
RECORD TYPE: Abstract
LANGUAGE: English
ABSTRACT: A CPAP treatment apparatus, as one form of positive **pressure** ventilatory assistance, includes a turbine/blower, operated by a mechanically coupled electrical motor that receives air or breathable gas at an inlet thereof, and supplies the breathable gas at a delivery **pressure** to a delivery tube/hose having a connection at the other end thereof with a nose **mask** . A microcontroller has an operational " **Mask** -Fit" mode. An initial constant **pressure** level is applied by the blower to the **mask** . If the functional mode is a manual mode, then the **mask** -fit test **pressure** is the current `set` **pressure** . If the functional mode is the automatic titration mode, the **mask** -fit test **pressure** is the 95th percentile **pressure** of the previous session, otherwise it is the base treatment **pressure** , e.g. 10-12 cm H2 O. This constant **pressure** is applied for a period of time, typically 1-3 minutes. The microcontroller continuously determines **mask** leak as the value, fLEAK, from a flow sensor, comparing this to a threshold, and providing the patent with a visual indication of degree of leak. In this way the patient can manipulate the **mask** to ensure correct fitting as indicated by the appropriate message or indication.

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File 155:MEDLINE(R) 1966-2003/Aug W5
File   5:Biosis Previews(R) 1969-2003/Aug W4
File  73:EMBASE 1974-2003/Aug W4
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Aug W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File 144:Pascal 1973-2003/Aug W4
File   2:INSPEC 1969-2003/Aug W4
File   6:NTIS 1964-2003/Aug W5
File   8:Ei Compendex(R) 1970-2003/Aug W4
File  94:JICST-EPlus 1985-2003/Aug W5
File  95:TEME-Technology & Management 1989-2003/Aug W3
File  99:Wilson Appl. Sci & Tech Abs 1983-2003/Jul
File  35:Dissertation Abs Online 1861-2003/Aug
File  65:Inside Conferences 1993-2003/Aug W5
Set     Items   Description
S1     134294   MASK? ?
S2      67623   RESPIRATOR OR RESPIRATORS OR VENTILATOR OR VENTILATORS OR -
             CPAP OR CONTINUOUS()POSITIVE()AIRWAY()PRESSURE
S3     728892   FIT OR FITS OR FITTED OR FITTING
S4    8432083   TEST OR TESTS OR TESTED OR TESTING
S5    3273227   PRESSURE
S6     315641   LEAK????
S7        602   S1(S)S3(S)S4
S8        206   S2 AND S7
S9      34855   S5 AND S6
S10        43   S8 AND S9
S11        21   RD (unique items)
S12         2   S11/2003
S13         1   S11/2002 [a duplicate]
S14        18   S11 NOT S12:S13
S15        18   Sort S14/ALL/PY,D

 15/6/11     (Item 11 from file: 155)
07534056   92397850   PMID: 1524028
  Characteristics of face seal  leakage  in filtering facepieces.
Sep 1992

 15/6/14     (Item 14 from file: 35)
01232902  ORDER NO: AAD92-05414
AEROSOL FILTRATION AND FACESEAL  LEAKAGE  CHARACTERISTICS OF FILTERING
FACEPIECES
  Year:    1991

 15/6/17     (Item 17 from file: 35)
932576  ORDER NO: AAD86-22286
PARTICLE SIZE - DEPENDENT  LEAKAGE  THROUGH THE FACESEAL OF NEGATIVE-
PRESSURE  HALF-MASK  RESPIRATORS  (AEROSOIS, SAFETY)
  Year:    1986

 15/6/18     (Item 18 from file: 155)
04507743   84150500   PMID: 6702601
Effect of facial hair on the face seal of negative-pressure respirators.
Jan 1984

 15/7/1     (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
```

08816526 20099771 PMID: 10633954
Effect of test exercises and mask donning on measured respirator fit.
Crutchfield C D; Fairbank E O; Greenstein S L
Environmental and Occupational Health, Arizona Prevention Center, University of Arizona, Tucson, USA.
Applied occupational and environmental hygiene (ENGLAND) Dec 1999, 14 (12) p827-37, ISSN 1047-322X Journal Code: 9103256
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Quantitative **respirator fit test** protocols are typically defined by a series of **fit test** exercises. A rationale for the protocols that have been developed is generally not available. There also is little information available that describes the effect or effectiveness of the **fit test** exercises currently specified in respiratory protection standards. This study was designed to assess the relative impact of **fit test** exercises and **mask** donning on **respirator fit** as measured by a controlled negative **pressure** and an ambient aerosol **fit test** system. Multiple donnings of two different sizes of identical **respirator** models by each of 14 **test** subjects showed that donning affects **respirator fit** to a greater degree than **fit test** exercises. Currently specified **fit test** protocols emphasize **test** exercises, and the determination of **fit** is based on a single **mask** donning. A rationale for a modified **fit test** protocol based on fewer, more targeted **test** exercises and multiple **mask** donnings is presented. The modified protocol identified inadequately **fitting** respirators as effectively as the currently specified Occupational Safety and Health Administration (OSHA) quantitative **fit test** protocol. The controlled negative **pressure** system measured significantly ($p < 0.0001$) more **respirator leakage** than the ambient aerosol **fit test** system. The bend over **fit test** exercise was found to be predictive of poor **respirator fit** by both **fit test** systems. For the better **fitting respirators** , only the talking exercise generated aerosol **fit** factors that were significantly lower ($p < 0.0001$) than corresponding donning **fit** factors.
Record Date Created: 20000208
Record Date Completed: 20000208

15/7/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

10974286 97327048 PMID: 9183835
Effect of leak **location on measured** respirator **fit**.
Crutchfield C D; Park D L
University of Arizona, Division of Community, Tucson 85719, USA.
American Industrial Hygiene Association journal (UNITED STATES) Jun 1997, 58 (6) p413-7, ISSN 0002-8894 Journal Code: 0371160
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
A significant difference in **leak** detection as a function of **leak** location was observed during a study assessing how well current models of quantitative **fit-test** systems detect **leakage**. Known sources of **leakage** (matched hypodermic needles) were introduced at three fixed locations into factory-

probed half-**mask** and full-face **respirators** mounted on a headform-breathing machine system. The **leak** locations were the bridge of the nose, the cheek, and the chin. Baseline **leakage** into each **respirator** was determined by conducting a **fit-test** with all fixed **leak** sources capped. **Fit tests** were repeated with each individual source uncapped. Study objectives included determining (1) how well each system measured the **leakage**, and (2) whether **leak** location had any effect on **leak** measurement. An ambient aerosol **fit-test** system (Portacount Plus) and a controlled negative **pressure** (CNP) **fit-test** system (FitTester 3000) were used. The ambient aerosol system detected an overall average of 37.2% of the known **leakage**, with a coefficient of variation of 44.7%. An analysis of variance showed significant differences in aerosol system measurements of **leakage** as a function of **leak** location and **mask** type ($p < 0.001$). A different pattern of aerosol **leak** detection as a function of **leak** location was observed between half-**mask** and full-face **respirators**, which appears to be related to differences in in-**mask** airflow dynamics. The CNP system detected an overall average of 97.9% of the known **leakage** through the same hypodermic needles, with a coefficient of variation of 4.3%. CNP system results were not affected by **leak** location ($p > 0.43$) or **mask** type ($p > 0.32$).
Record Date Created: 19970708
Record Date Completed: 19970708

15/7/3 (Item 3 from file: 94)
DIALOG(R)File 94:JICST-EPlus
(c)2003 Japan Science and Tech Corp(JST). All rts. reserv.
03002683 JICST ACCESSION NUMBER: 96A1005443 FILE SEGMENT: JICST-E
A Study of Facepiece-to-face Fitting of a Gas Mask.
TANAKA SHIGERU (1); NAKAZA MASAHIRO (1); SEKI YUKIO (1); TANAKA MASAMI (2); KIMURA KAZUSHI (2); NOZAKI KOSUKE (2)
(1) Kitasato Univ. School of Allied Health Sci.; (2) Koken Ltd.
Rodo Kagaku(Journal of Science of Labour), 1996, VOL.72,NO.11, PAGE.450-454, FIG.4, TBL.1, REF.17
JOURNAL NUMBER: G0016AAP ISSN NO: 0022-443X CODEN: ROKAA
UNIVERSAL DECIMAL CLASSIFICATION: 658.382
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: A quantitative **respirator-fitting test** in the use of half and full facepieces of gas **masks** was carried out for ten male subjects by means of dichlorotetrafluoroethane (Freon-114) gas. The **leakage** rates were measured at rest and during a physical exercise in the form of a step **test** after asking the subjects to put on a gas **mask** using their own judgment. Further, **leakage** rates during a similar exercise were measured after performing a qualitative **fit test** by the negative **pressure** method. When the subjects put on a half **mask** by their own judgment, high **leakage** rates were obtained among individuals with little experience in wearing a gas **mask**. Also, in most subjects, **leakage** rates during an exercise were higher than those at rest. Low **leakage** rates were attained after performing a **fit test**. On the other hand, with a full facepiese, **leakage** rates were low and did not differ much between resting and exercise conditions. These findings suggest that when workers wear a gas **mask**, a **fit test** by the negative **pressure** method would be effective in assuring its satisfactory facepiece-to-face **fitting**. (author abst.)

15/7/4 (Item 4 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

08628208 95316735 PMID: 7796310
[A study for the practical use of the mask fitting tester]
Narukiyo Y; Tsukashima H; Nagoya T
Department of Employee Welfare, Toto Ltd., Japan.
Sangyo eiseigaku zasshi = Journal of occupational health (JAPAN) May 1995, 37 (3) p177-85, ISSN 1341-0725 Journal Code: 9507473
Document type: Journal Article ; English Abstract
Languages: JAPANESE
Main Citation Owner: NLM
Record type: Completed
The standards require replaceable dust **respirators** to be designed so that the wearer can easily check facepiece-to-face **fitting** at any time. The common practice adopted is an air **leakage** examination between the facepiece and the face in a negative **pressure** created by sealling-off inhalation area and breathing-in (called "a negative **pressure** method"). This method offers only subjective **testing** made by the wearer himself or herself, no objective **testing** is possible by the third party including supervisors and hygiene staff. Accordingly, we conducted the practical use **test** of the **Mask Fitting** Tester (Model MT-02, Roken type) by letting wearers to use the tester at a sanitaryware plant where workers are well instructed for how to wear **respirators** and also **respirators** are used in good care and maintenance. In addition, a questionnaire survey was conducted to investigate how wearers perceive the practical use of the **Mask** Tester. The following are the conclusions of the study and the survey for the practical use of the **Mask** Tester. 1) At the first fitness **test** , when examinees wear the **respirator** as in the usual manner without given particular instructions, 50% of examinees are found unachieved with the **leakage** rate of the desired value of 5% of less. 2) All the examinees unachieved were instructed by hygiene staff followed by **fitting test** to check their **leakage** rate until they pass the desired value. After repeating this three times, there were no examinees found unachieved. 3) 88.2% of these examinees could achieve the desired value only by adjusting headbands and correcting the position of facepiece under instructions.
(ABSTRACT TRUNCATED AT 250 WORDS)
Record Date Created: 19950728
Record Date Completed: 19950728

15/7/5 (Item 5 from file: 6)
DIALOG(R)File 6:NTIS

1979879 NTIS Accession Number: PB97-105050
Performance of Surgical Masks. Final Performance Report
(Rept. for 1 Sep 92-31 Aug 94)
Willeke, K.
Cincinnati Univ., OH. Dept. of Environmental Health.
Corp. Source Codes: 006394024
Sponsor: National Inst. for Occupational Safety and Health, Cincinnati, OH.
29 Jun 95 16p
Languages: English
Journal Announcement: GRAI9701
Sponsored by National Inst. for Occupational Safety and Health, Cincinnati, OH.
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email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: NIOSH-5-RO1-OH02948
Surgical **masks** and **respirators** currently in use or being considered for use in the health care industry were evaluated. Collection efficiencies with bacteria were compared to those with inert, nonliving **test** particles currently used to evaluate the performance of industrial **masks** and **respirators** . If there was an adequate face seal **fit** of the **mask** to the face of the wearer, the findings indicated that higher efficiency filters in health care **masks** worked better. When there was a large face seal **leak** , the higher performance **mask** may actually perform worse than a less efficient **mask** , as the higher **pressure** drop across the higher performance **mask** directs more air flow through the face seal **leak** . Spherical Streptococcus-salivarius bacteria were able to penetrate as efficiently as inert corn-oil **test** particles in the size range from 0.9 to 1.7 micrometers. Less penetration was noted with rod shaped bacteria. The ratio of the length to the diameter of the bacteria was an important factor. A filter 95% efficient against spherical **test** particles may be 97 to 97.5% effective against Mycobacterium-tuberculosis bacteria.

15/7/8 (Item 8 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2003 Elsevier Science B.V. All rts. reserv.
05770672 EMBASE No: 1994165302
A validation study of respirator **fit testing by controlled negative** pressure
Crutchfield C.D.; Ruiz A.M.; Van Ert M.D.
Division of Community/Envtl. Health, University of Arizona, 1435 N. Fremont Avenue,Tucson, AZ 85719 United States
Applied Occupational and Environmental Hygiene (APPL. OCCUP. ENVIRON. HYG.) (United States) 1994, 9/5 (362-366)
CODEN: AOEHE ISSN: 1047-322X
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
Respirator fit testing is a fundamental part of a respiratory protection program. The development of a quantitative **respirator fit test** method based on controlled negative **pressure** (CNP) provides an alternative to standard aerosol **fit test** methods that is faster and less dependent on ambient **test** conditions. This study was conducted to evaluate the performance of a controlled negative **pressure** system using the method validation protocol proposed in the American National Standards Institute (ANSI) **Respirator Fit Test** Methods Standard. The study procedure involved measuring 100 pairs of sequential **fit tests** using a generated aerosol system and a controlled negative **pressure** system. A study population of 25 subjects was **tested** with both half- **mask** and full-face air purifying **respirators** . Additional **fit test** series were accomplished with each **mask** type by inserting **leak** sources between each subject's cheek and **respirator** faceseal. The **leaks** were used to achieve a distribution of **fit test** results above and below the **test** acceptance criterion of a **fit** factor of 100. Study results show that the controlled negative **pressure** system exceeded the ANSI validation criteria in the areas of **test** sensitivity, **test** specificity, and predictive value of a pass. The CNP system did not pass any **respirators** that were subsequently rejected by the aerosol system. The CNP system did not meet

the ANSI criterion for predictive value of a fail. Thirty **respirators** with induced **leakage** exceeding 530 ml/min were rejected by the CNP system but subsequently passed the generated aerosol **fit test** .

15/7/9 (Item 9 from file: 95)
DIALOG(R)File 95:TEME-Technology & Management

00808845 F94070261969
Development of a dichotomous-flow quantitative fit tester for half-mask and full-facepiece respirators
(Entwicklung eines Testverfahrens mit zweigeteiltem Fluss zur quantitativen Ueberpruefung der Passform von Halb- und Vollmaskenatemgeraeten)
Krishnan, U; Willeke, K; Juozaitis, A; Lehtimaeki, M; Szewczyk, K
Univ. of Cincinnati, USA
American Industrial Hygiene Association Journal, v55, n3, pp223-229, 1994
Document type: journal article Language: English
Record type: Abstract
ISSN: 0002-8894
ABSTRACT:
A new method to quantitate the **fit** of elastomeric half- **mask** and full-facepiece air-purifying **respirators** was developed. In this method the two flows, catridge flow and **leak** flow, are separate. The air-purifying cartridges of the **respirator** are attached to a reference **respirator** . A selected flow equivalent to the inhalation flow of the wearer is drawn through the cartridge pair. A feedback system consisting of a **pressure** controller and a control valve is used to set the **pressure** drop in the **mask** on the subject's face equal to the **pressure** drop in the reference **mask** . The faceseal **leak** flow is measured while the subject holds his or her breath for a short period of time. The ratio of total flow (cartidge flow + **leak** flow) to **leak** flow is a measure of **fit** and is defined as the flow **fit** factor. Aerosol **fit** factors and flow **fit** factors were determined using sampling probes in three **mask** locations: top, center, and bottom. A Kruskal-Wallis **test** showed that aerosol **fit** factors obtained from the three locations were significantly different from each other (p = 0.0001) while the corresponding flow **fit** fators were not. Aerosol **fit** factors obtained with the center probe had the least variability. The coefficient of variation in aerosol **fit** factors ranged from 5.4 % for the center probe to 19 % for the bottom probe; the coefficient of variation in flow **fit** factors was much lower, ranging from 1.7 % for the top probe to 2.2 % for the center and bottom probes.

15/7/10 (Item 10 from file: 73)
DIALOG(R)File 73:EMBASE

05330105 EMBASE No: 1993098190
Determination of inspiratory pressures and flow rates for work rate-dependent quantitative respirator **fit testing**
Crutchfield C.D.; Pham T.K.; Van Ert M.D.
School of Health Related Professions, University of Arizona,Tucson, AZ 85719 United States
Applied Occupational and Environmental Hygiene (APPL. OCCUP. ENVIRON. HYG.) (United States) 1993, 8/2 (103-107)
CODEN: AOEHE ISSN: 1047-322X
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
Quantitative **respirator fit testing** is used to select **respirators**

for individual workers and to gain insight into potential contaminant **leakage** . Current **fit test** exercises are designed to primarily challenge the **respirator** facepiece-to-face seal. Inspiratory **pressure** across any break in the seal is also an important determinant of the amount of **leakage** through the break. **Fit tests** conducted at resting respiratory patterns may not be representative of **leakage** that occurs at respiratory patterns employed in the workplace. By design, the controlled negative **pressure fit test** method can control the driving force for **leakage** into a **respirator** by selecting a challenge **pressure** that represents actual use inspiratory pressures. In this study, mean inspiratory pressures and flow rates were determined for males and females working at external work rates of 0, 180, 360, and 540 kg m/min. Effects of **mask** type and breathing resistance were determined using both half- **mask** and full-face **respirators** equipped with cartridges of relative low, medium, and high breathing resistance. Inspiratory **pressure** was found to be strongly dependent on work rate and cartridge resistance. **Mask** type and gender also had significant effects on mean inspiratory **pressure** . Inspiratory flow rate was significantly affected by work rate and **mask** type. Data from the study can be used to conduct work rate-dependent **fit testing** with the controlled negative **pressure** method.

15/7/12 (Item 12 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01261408 ORDER NO: AAD93-02422
DEVELOPMENT AND VALIDATION OF A DICHOTOMOUS FLOW QUANTITATIVE RESPIRATOR **FIT TEST**
Author: KRISHNAN, USHA
Degree: PH.D.
Year: 1992
Corporate Source/Institution: UNIVERSITY OF CINCINNATI (0045)
Adviser: KLAUS WILLEKE
Source: VOLUME 53/09-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 4599. 81 PAGES

A new method to quantitate the **fit** of half- **mask** and full-facepiece air-purifying **respirator** , has been developed. It is called 'the dichotomous-flow **respirator fit test** '. In this method of **fit testing** , the user's cartridges are **fitted** on a reference **mask** and air is drawn through these cartridges at a selected flow rate. A feedback system, consisting of a **pressure** controller and a control valve, sets the **pressure** drop in the **mask** equal to the **pressure** drop in the reference **mask** . The in- **mask leak** flow rate is measured while the subject temporarily holds his or her breath and the ratio of the total flow rate (cartridge and **leak** flow rates combined) to the **leak** flow rate is determined. This ratio, defined as the 'flow **fit** factor', is a measure of the **fit** of the **mask** to the wearer's face. The flow **fit** factor was found to be independent of sampling probe location so that the probe can be located on a modified cartridge and the **fit test** performed with the user's own **mask** and cartridges.

The relationship between **pressure** drop and cartridge flow was investigated for cartridges of various types and brands. The influence of **mask pressure** drop on faceseal **leakage** was also investigated. Aerosol **fit** factors and flow **fit** factors were determined sequentially on humans. The coefficient of variation in aerosol **fit** factors was approximately twice those in the corresponding flow **fit** factors. Variation in **fit** factor data was used to estimate the variation in faceseal **leakage** during

fit testing .
The dichotomous-flow **respirator fit test** is non-invasive and therefore can be used in the workplace to determine the **fit** of the worker's actual **mask** . Unlike the aerosol method that necessitates the use of HEPA cartridges during the **test** , the dichotomous flow method can be performed with any kind of cartridge. The system is portable and therefore convenient for field-use. It can also be used to determine the mechanical integrity of the facepiece and the exhalation valve.

15/7/13 (Item 13 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
07057410 91298294 PMID: 2069125
A feasibility study of quantitative respirator **fit testing by controlled negative** pressure .
Crutchfield C D; Eroh M P; Van Ert M D
School of Health Related Professions, University of Arizona, Tucson 85719.
American Industrial Hygiene Association journal (UNITED STATES) Apr 1991, 52 (4) p172-6, ISSN 0002-8894 Journal Code: 0371160
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
The feasibility of using a direct measure of **respirator leakage** flow rate as a quantitative index of **respirator** face seal **fit** has been explored through the use of a new controlled negative **pressure** method. The method is based on exhausting air from a temporarily sealed **respirator** facepiece at a rate sufficient to generate and then sustain a constant negative **pressure** inside the facepiece while the wearer holds his breath. The magnitude of the negative **pressure** is preselected to replicate the mean inspiratory **pressure** inside the **mask** during normal wear. With the air-purifying paths into the **respirator** temporarily blocked, measurement of the exhaust flow rate yields a synonymous measure of the **leakage** flow rate into the **mask** during inspiration under normal use conditions. The feasibility of using the new method to quantify **respirator fit** was assessed in a preliminary study that compared its performance with a quantitative **fit test** method based on the use of dichlorodifluoromethane as a challenge agent. Study data exhibit a high degree of correlation (r greater than 0.99) and no significant difference between the two methods over a range of controlled **mask leakage** rates. A major advantage of the new method is that a worker can be **fit tested** with his assigned **respirator** because the method does not require a destructive sampling probe. Other significant benefits compared to current methods used to quantify **respirator fit** appear to include (1) ease of **test** administration, (2) simplicity of **test** components, (3) lack of a potentially toxic challenge agent, (4) a straightforward calibration procedure, (5) multiple **test** capability, (6) immediacy of **test** results, and (7) field portability of the **test** system.
Record Date Created: 19910813
Record Date Completed: 19910813

15/7/15 (Item 15 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
05720641 88073924 PMID: 3687730
The effect of aerosol size distribution and measurement method on

respirator **fit**.
Holton P M; Willeke K
Department of Environmental Health, University of Cincinnati, OH 45267-0056.
American Industrial Hygiene Association journal (UNITED STATES) Oct 1987, 48 (10) p855-60, ISSN 0002-8894 Journal Code: 0371160
Contract/Grant No.: R01-OH-01301; PHS
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
The particle size-dependent **leakage** into a **respirator** was examined by measuring the **leakage** of particle sizes between 0.07 to 4.4 microns through three hole sizes in a negative- **pressure** half- **mask** **respirator** worn by a human subject. This investigation showed that the size distribution of an aerosol **test** agent and the measurement method have an effect on the **leakage** measured in a quantitative **fit** **test** . For instance, the ratio of percent **leakage** measured by light scattering between **test** aerosols with count median diameters of 2.2 and 0.28 microns can be as large at 5:1. Likewise, the ratio of the percent **leakage** measured by a particle count method vs. a mass method of detection of the same polydisperse aerosol with a count median diameter equal to 2.2 microns can be as high as 4:1. The mass **leakage** into a **mask** with a **leak** is also greater for an exposure aerosol with a count median diameter between 0.15 to 0.30 micron compared to exposure aerosols with larger count median diameters for aerosols with the same mass concentration.
Record Date Created: 19880113
Record Date Completed: 19880113

15/7/16 (Item 16 from file: 6)
DIALOG(R)File 6:NTIS

1299585 NTIS Accession Number: DE87005579
Powered Air-Purifying Respirator **Study: Final Report**
da Roza, R. A. ; Cadena-Fix, C. A. ; Kramer, J. E.
Lawrence Livermore National Lab., CA.
Corp. Source Codes: 068147000; 9513035
Sponsor: Department of Energy, Washington, DC.
Report No.: UCRL-53757
Jul 86 33p
Languages: English
Journal Announcement: GRAI8714; NSA1200
Portions of this document are illegible in microfiche products. Original copy available until stock is exhausted. Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: W-7405-ENG-48
Three brands of powered air-purifying **respirators** were subjected to a simulated-work-place study. They were worn by six human subjects while working at 80% of their cardiac reserve on a treadmill. The air flow into the **respirator** was controlled to match that of a **respirator** with a newly charged battery and with various stages of battery discharge and filter plugging. The simulation took place in a large quantitative **fit**

test chamber containing PEG 400 aerosol. The penetration of aerosol into the breathing zone of the **respirator** , the **pressure** in it, and the air flow were monitored while the subject was warming up as well as during the 80% **tests** . The exercises recommended in ANSI Z88.2 for helmets were also used after the 80% **tests** were completed. The subjects were **tested** clean shaven, with three days' growth of stubble, and with a two-month beard growth. A striking result was that the aerosol penetration into the two-helmet **respirators** increased dramatically as the subjects work rate increased. On the other hand, penetration into the half **mask** did not change with work rate. The penetration increased as the air flow was decreased in all cases for the helmets and for beard and stubble cases for the half **mask** . However, for he tight- **fitting** half **mask** on a clean-shaven face, the average penetration stayed below 0.001 for all flows. 18 figs, 5 tabs. (ERA citation 12:016915)

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File  98:General Sci Abs/Full-Text 1984-2003/Jul
File   9:Business & Industry(R) Jul/1994-2003/Sep 01
File  16:Gale Group PROMT(R) 1990-2003/Sep 02
File 160:Gale Group PROMT(R) 1972-1989
File 148:Gale Group Trade & Industry DB 1976-2003/Sep 02
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Sep 02
Set     Items   Description
S1      70966   MASK? ?
S2      12655   RESPIRATOR OR RESPIRATORS OR VENTILATOR OR VENTILATORS OR -
             CPAP OR CONTINUOUS()POSITIVE()AIRWAY()PRESSURE
S3     766320   FIT OR FITS OR FITTED OR FITTING
S4    2155585   TEST OR TESTS OR TESTED OR TESTING
S5     755343   PRESSURE
S6     117136   LEAK????
S7        122   S1(S)S3(S)S4
S8       9151   S5(S)S6
S9          2   S7(S)S8 [not relevant]
S10         5   S7 AND S8
S11         3   S10 NOT S9

 11/3,AB,K/3     (Item 1 from file: 16)
DIALOG(R)File  16:Gale Group PROMT(R)
(c) 2003 The Gale Group. All rts. reserv.
08453356    Supplier Number: 72116203
Keys to effective noninvasive ventilation, Part 1: Initial steps.
MOORE, MICHAEL J.; SCHMIDT, GREGORY A.
The Journal of Critical Illness, v16, n2, p64
Feb, 2001
Language:  English    Record Type:  Fulltext
Document Type: Magazine/Journal; Refereed; Professional
Word Count:   3830
     ABSTRACT: Noninvasive positive  pressure  ventilation (NIPPV) is the
standard of care for many patients with acute respiratory failure...
...a variety of masks available when fitting the patient; achieving
effective patient-ventilator interface, avoiding  leaks , and maximizing
comfort are the most important initial considerations.
       For patients in acute respiratory failure...improve the chances of
success in achieving effective gas exchange.
       Mask fit
The challenge of fitting the mask correctly is a common deterrent to NIPPV.
Meduri and colleagues (21) tested a tight- fitting oronasal mask that had an
inflatable cuff. Of 10 patients, 2 could not be fitted, I stopped using the
mask because of discomfort, and 2 had problems with nasal bridge abrasions.
In a subsequent study, 2 of 18 patients refused a mask, and 1 suffered mild
facial pressure necrosis.  (18)
       In a large trial of 158 patients...
...mask in which added foam rubber reduced dead space and permitted a tight
fit, preventing leakage; airflow and pressure-support levels were carefully
adjusted to maximize ventilation and minimize leaks, and all patients
tolerated the mask.
       * Nasal versus oronasal masks: Both nasal (2,4,5...
...adequacy of the patient-ventilator interface.
       It is very important to check closely for mask leaks and to adjust
airflow and  pressure -support levels. Inflatable cuffs, nasal bridge
protection with a wound care dressing, and the availability...of the mask
to minimize carbon dioxide rebreathing. It is important to check carefully
```

for **leaks** and to adjust airflow and **pressure** -support levels...

```
File 149:TGG Health&Wellness DB(SM) 1976-2003/Aug W3
File 636:Gale Group Newsletter DB(TM) 1987-2003/Sep 02
File 441:ESPICOM Pharm&Med DEVICE NEWS 2003/Aug W5
File  20:Dialog Global Reporter 1997-2003/Sep 03
Set     Items   Description
S1      74599   MASK? ?
S2      16376   RESPIRATOR OR RESPIRATORS OR VENTILATOR OR VENTILATORS OR -
             CPAP OR CONTINUOUS()POSITIVE()AIRWAY()PRESSURE
S3     667476   FIT OR FITS OR FITTED OR FITTING
S4    1802001   TEST OR TESTS OR TESTED OR TESTING
S5    1085942   PRESSURE
S6     159579   LEAK????
S7        142   S1(S)S3(S)S4
S8       5169   S5(S)S6
S9          9   S7(S)S8
S10         5   S2 AND S9
S11         4   RD (unique items)
S12         4   S9 NOT S10
S13         4   RD (unique items) [not relevant]

 11/3,AB,K/1     (Item 1 from file: 149)
DIALOG(R)File 149:TGG Health&Wellness DB(SM)
(c) 2003 The Gale Group. All rts. reserv.
01820496     SUPPLIER NUMBER: 53979316    (USE FORMAT 7 OR 9 FOR FULL TEXT)
Esophageal-Directed Pressure Support Ventilation in Normal Volunteers(*).
Barnard, Mathew; Shukla, Avinash; Lovell, Tim; Goldstone, John
Chest, 115, 2, 482(1)
Feb, 1999
PUBLICATION FORMAT: Magazine/Journal; Refereed   ISSN: 0012-3692
LANGUAGE: English  RECORD TYPE: Fulltext  TARGET AUDIENCE: Professional
WORD COUNT:   4069    LINE COUNT:  00374
...     increasingly sophisticated methods have been devised to make the
interaction between the patient and the  ventilator  as sensitive as
possible. To reduce the work performed during the initial phase of
inspiration...
...The provision of ventilatory support for the patient is dependent on the
ability of the  ventilator  to sense inspiration. Furthermore, airway
pressure must be transmitted to the chest effectively such that alveolar
pressure is positive during inspiration. Under ideal circumstances, the
ventilator  senses inspiration immediately and little pressure difference
occurs across the lungs. This is usually achieved...
...   When lung mechanics are abnormal, many factors prevent rapid
detection of inspiration by the  ventilator , the essential element being
that transmission of the inspiratory signal to the  ventilator  is delayed.
In addition, the preset pressure may be dissipated across the lungs and
without...
...patient is often not recognized and described at the bedside as the
patient "fighting the  ventilator ."(2) In this circumstance, there is a
substantial amount of energy wasted resulting in patient discomfort.
     It would be preferable to trigger the  ventilator  from a more direct
indicator of inspiratory muscle contraction. The effect of the site of the
inspiratory trigger on the patient- ventilator  interface was investigated
in a mechanical lung model by Takahashi and coworkers.(3) They found...
...baseline.
     We aimed to investigate whether this was a potential strategy in
humans. Supplying the  ventilator  with pressure signals from the esophagus
```

implies that supported breaths are both triggered from and...
...ought to be minimized owing to early transmission of the pressure change signal to the **ventilator** , and the target pressure ought to be directly related to the ventilatory workload. A discrepancy...
...used could decrease the response time to initiation of gas flow, and potentially enhance patient- **ventilator** interaction and patient comfort. We have termed this mode esophageal directed pressure support (EDPS). We...
...of EDPS in human volunteers and measure the work of breathing and degree of patient **ventilator** desynchrony when compared with conventional IPS.

MATERIALS AND METHODS

Five normal human volunteers were studied25, who had no intercurrent disease.

Subjects breathed through a **ventilator** (Servo 900C; Siemens; Berkshire, UK) in pressure support mode. Flow and airway pressure were measured at the circuit-Y. Inspiratory and expiratory pressure-sensing transducers inside the **ventilator** were connected together with plastic tubing and joined by a three-way tap to the...
...connection allowed the Pes signal to be simultaneously monitored on the recording instruments.

Measurements

Airway **pressure** , Pes, and inspiratory flow rate were measured for each subject. Airflow was measured with a...
...Rudolph; Kansas City, MO) and volume was obtained from the integrated flow signal. A tight- **fitting** sealed face **mask** was strapped to each subject and **tested** to be **leak** free at 35 cm (H.sub.2)O. The pneumotachograph and airway **pressure** transducer were placed between the face **mask** and "Y" of the **ventilator** tubing. Pes was measured using a 10-cm latex balloon catheter filled with 0.5...
...placement of the balloon was according to the method described by Baydur et al.(4) **Pressure** and flow were calibrated with a water manometer and an air flowmeter (Platon; London, UK...
...breathing was achieved with linear 5-mm and 3-mm diameter resistors added to the **ventilator** circuit.

The **ventilator** controls were adjusted to enable sensing from Pes. In some subjects, resting Pes at the end of expiration was above zero. This was misinterpreted by the **ventilator** as a positive airway pressure when configured in EDPS mode. To avoid an increased load, whereby the negative deflection in Pes to successfully trigger the **ventilator** would have to equal the resting end expiratory Pes plus the triggering pressure, PEEP was applied. Since the **ventilator** is designed to trigger when airway pressure falls to a set level below PEEP, triggering...
...equal to resting Pes) minus the triggering pressure.

Protocol

Subjects breathed at rest without the **ventilator** for baseline measurements. The subjects then breathed through the **ventilator** in pressure support mode. The pressure support level was adjusted to produce a tidal volume...
...target Pes level of 0 cm (H.sub.2)O. The working pressure of the **ventilator** was adjusted until a target tidal volume of 10 mL/kg was achieved. Measurements were...
...time between the first negative Pes deflection and the initiation of inspiratory flow from the **ventilator** . Inspiratory response delays were measured for unloaded and 3-mm resistive breathing during IPS and...
...Pes was measured from the pressure tracings.

The mean of five representative breaths from each **ventilator** setting was used for analysis. Differences between IPS and EDPS were

evaluated during each breathing...
...of ventilation.

Table 1--Inspiratory Time Delay Recorded in Five Normal Subjects Breathing Through the **Ventilator** With Conventional IPS or From EDPS

	Unloaded	Loaded (3 mm)
Mean inspiratory time delay (ms...		

...0.001, Table 2).

Table 2--PTP Recorded in Five Normal Subjects Breathing Through the **Ventilator** With IPS or From EDPS

	Unloaded	5 mm	3 mm
Mean PTP during spontaneous			

7...machine according to individual patient considerations. However, early efforts at allowing patients to breathe through **ventilator** circuitry were hampered by apparatus-imposed additional work loads due to unsophisticated valve technology. Advances in **ventilator** design have greatly reduced their resistance to spontaneous breathing and once again assisted or supported...
...ventilation to spontaneous breathing,(6,7) However, there remains a requirement for improving the patient **ventilator** interaction, particularly in patients with increased airway resistance.

EDPS involves triggering the **ventilator** from an earlier signal of inspiratory effort than the conventionally used airway pressure. This carries...
...might decrease that part of the work of breathing which is associated with triggering the **ventilator** . This is not only of theoretical concern. The endotracheal tube and apparatus can increase the...
...an earlier signal of inspiratory effort is a potential reduction in failing to trigger the **ventilator** . Dysynchrony describes a discrepancy between the frequency of inspiratory efforts and the frequency of supported...
...be greater than the sum of intrinsic PEEP plus trigger pressure to successfully trigger the **ventilator** . In the setting of significant intrinsic PEEP, the magnitude of pressure developed by the respiratory...
...as above, but implies that contractions smaller than this amount will fail to trigger the **ventilator** . These ineffective efforts may be uncomfortable, and also carry a metabolic cost. EDPS takes Pes...resistance and imposed work of the endotracheal tube and airways. Previous improvements to the patient **ventilator** interaction, such as flow triggering, have concentrated on measurements taken from and interventions directed at...
...standard esophageal balloon catheter by simply connecting it to the inspiratory pressure transducer of the **ventilator** . The inspiratory pressure transducer is readily accessible in the **ventilator** (Servo 900C) and inspiratory flow is switched on when inspiratory pressure is below the trigger...
...156:369-373

(2) Rossi A, Appendini L. Wasted efforts and dysynchrony: is the patient- **ventilator** battle back? Intensive Care Med 1995; 21:867-870

(3) Takahashi T, Takezawa J, Kimura...
...L, Rauss A, Benito S, et al. Comparison of three methods of gradual withdrawal from **ventilator** / support during weaning from mechanical ventilation. Am J Respir Crit Care Med 1994; 150:896 879

(9) Jubran A, Van de Graaff WB, Tobin MJ. Variability of patient-**ventilator** interaction with pressure support ventilation in patients with chronic obstructive pulmonary disease. Am J Respir...
...11) Banner MJ, Kirby RR, Blanch PB. Site of pressure measurement during

spontaneous breathing with **continuous positive airway pressure** : effect on calculating imposed work of breathing. Crit Care Med 1992; 20:528-533

(12...

...et al. Additional work of breathing imposed by endotracheal tubes, breathing circuits, and intensive care **ventilators** . Crit Care Med 1989; 17:671-677

(14) Kimura T, Takezawa J, Nishiwaki K, et...

...Blanch PB, Kirby RR. Imposed work of breathing and methods of triggering a demand-flow, **continuous positive airway pressure** system. Crit Care Med 1993; 21:183-190

(17) Sassoon CSH, Gruer SE. Characteristics of the **ventilator** pressure and flow-trigger variables. Intensive Care Med 1995; 21:159-168

11/3,AB,K/2 (Item 2 from file: 149)

DIALOG(R)File 149:TGG Health&Wellness DB(SM)

01609223 SUPPLIER NUMBER: 17928824 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Institutional control measures for tuberculosis in the era of multiple drug resistance: ACCP/ATS Consensus Conference. (American College of Chest Physicians/American Thoracic Society)

Bates, Joseph H.; Nardell, Edward

Chest, v108, n6, p1690(21)

Dec, 1995

PUBLICATION FORMAT: Magazine/Journal ISSN: 0012-3692 LANGUAGE: English

RECORD TYPE: Fulltext TARGET AUDIENCE: Professional

WORD COUNT: 18908 LINE COUNT: 01567

... for Occupational Health and Safety; OSHA=Occupational Safety and Health Administration; PAPR=powered air-purifying **respirator** ; TB=tuberculosis; UV=ultraviolet; UVGI=ultraviolet germicidal irradiation

Key words: drug-resistant tuberculosis; nosocomial tubercolosis...not only an institution's need for special isolation rooms, but also its utilization of **respirators** for staff who care for patients in isolation. To our knowledge, there are no published...have been used as criteria in the absence of field trial data.

The ability of **respirators** to protect workers from certain airborne hazards has been well established. To the extent that **respirators** reduce the risk of inhaling droplet nuclei, they will reduce the chance of TB infection. **Respirators** require worker cooperation, but they cannot be worn continuously, and they will not be worn...

...be considered independently, since their effects are often complementary or additive in reducing risk. A **respirator** that is only 80% efficient in excluding droplet nuclei provides protection approximately equivalent to increasing...

...each doubling of effective ventilation reduces by half the risk of infection. If such a **respirator** was properly worn at the time the hazard was present, its protection would be equivalent...

...about two or three.[10] This change in ventilation, together with the use of a **respirator** that was only 80% efficient, would have been nearly fully protective against one of the...

...numbers of infectious particles in the air are few, further increments in filtration efficiency of **respirators** would be predicted to contribute minimal added protection. It is important to recognize that as part of a comprehensive infection control program, **respirators** need not be 100% efficient to be useful. In the two retrospective reviews of precautions implemented in hospitals in New York and Miami, previously cited, use of

respirators less efficient than HEPA appear to have been effective when used together with administrative and environmental controls.[25,26]

SELECTION OF **RESPIRATORS**

The reduction of transmission of infectious particles through the filtration material of face masks and **respirators** is accomplished by the impaction of particles on the filter or by electrostatic attraction. Five...
...the filtration material is face-seal leakage, the ability of unfiltered air to penetrate a **respirator** between the **respirator** 's edge and the wearer's face.[21,124-128] Both filtration efficiency and face-seal leakage determine the effective protection of personal **respirators** . In general, the more efficient the filtration material, the greater the airflow resistance, the greater...
...tendency for face-seal leakage, and the better the face-seal required. For example, two **respirators** , one with 99.97% filter efficiency (HEPA) and another with 95% filter efficiency, may provide similar protection if the face-seal leakage of both **respirators** averages 10 to 20%, as is often the case.[23]

The filtration characteristics of a variety of single-use masks and **respirators** have been assessed using mycobacterial aerosols of a particle size distribution believed to be representative...
...nuclei (1 to 5 [micro]m respirable particles).[129] In this investigation, face masks and **respirators** were sealed to the test apparatus to prevent leakage around the filtration material. As expected, HEPA **respirators** excluded a mean of more than 99.99% of the aerosolized mycobacteria. However, the filtration materials of most other masks and **respirators** tested were also highly efficient, trapping a mean of 96.9% or more of airborne mycobacterial aerosol. When masks and **respirators** are worn by people rather than sealed to a test apparatus, particles that reach the...
...likely to be due to leakage around the face seal. As of this writing, no **respirator** class other than HEPA is certified by the National Institute for Occupational Health and Safety...
...this document was approved for publication, NIOSH has finalized a new certification standard for particulate **respirators** and has certified a broad range of **respirator** models for TB protection. Additional information may be obtained by calling the NIOSH toll-free...
...testing procedures and standards have been proposed by NIOSH, which should result in certification of **respirators** of lower efficiency than HEPA for use in TB control.[130] CDC has proposed 95...
...10% face-seal leakage, as satisfactory protection for most TB control applications.[21] Positive-pressure **respirators** designed to minimize face-seal leakage (powered air-purifying **respirators** [PAPRs] and air-line **respirators**) are still recommended for the most hazardous applications, such as autopsies of patients with MDR TB.[21]

Face-seal **leakage** is affected by the match between size and shape of the face piece and facial features, facial hair, faulty **respirator** positioning, incorrect placement of head straps, facial oils, perspiration that leads to slippage, and damage to the **respirator** . Face-seal **leakage** is minimized by training regarding **respirator** usage and by **fit testing** . Only qualitative **fit testing** is possible for disposable **respirators** and should be done prior to **respirator** selection. In addition, workers should perform **fit** checks on themselves every time they put on a **respirator** , given the potential for damage as disposable **respirators** are reused. Disposable **respirators** can be reused by workers as long as the **mask** remains clean and structurally intact.[21] Given the limited availability of **respirator** sizes, their reuse, and the inability to

quantitatively **fit test** disposable **respirators** , the potential for significant (10 to 20%) face-seal **leakage** remains. In contrast, PAPRs and line **respirators** can be quantitatively **fit tested** and have an estimated face **leakage** of only 2%.[21] About 15 to 20% of workers are unable to obtain a tight **fit** with available negative- **pressure respirators** , and these persons should use a PAPR when a **respirator** is required. Workers with beards cannot be **fitted** with negative- **pressure respirators** due to excessive face-seal **leakage** , and may also require positive- **pressure respirators** in hazardous settings. It is anticipated that once the new certification procedures for **respirators** are finalized and implemented, a wider range of sizes and styles of disposable and reusable **respirators** will become available.

The new certification procedures for **respirators** should lead to a better adaptation of technology developed for industrial applications to the very...

...considerations.[22-24,131-133]

Two recent cost-effectiveness analyses based on the current HEPA **respirator** recommendations calculated the cost of preventing a single case of TB. Based on survey data...

...TB case ranged from $1.3 million under optimal conditions, to $18.5 million if **respirator** utilization was suboptimal and more workers were exposed than necessary.[135] This approach to the issue of **respirators** has sparked controversy, with some critics pointing out that **respirators** should not be considered apart from administrative and environmental precautions.[136-142] While some critics...

...be more unethical not to consider cost, since the large sums of money spent on **respirators** will be unavailable for other, potentially more cost-effective interventions.[143] Whereas the broad application...

...to result in expenditures well out of proportion to risk, selective use of less costly **respirators** of sufficient efficacy pushes the cost-efficacy analysis back toward an acceptable balance.[22-24...

...is necessary.[143]

In view of both the potential utility and the inherent limitations of **respirators** to prevent TB transmission, and the cost considerations just discussed, efforts must be undertaken to tailor the application of **respirators** of various efficiencies to specific TB risks. Effective respiratory protection is currently required for three...

...procedure rooms, and in the transport of potentially infectious patients.[21,29] The use of **respirators** in isolation rooms and the categories of patients who require care in isolation rooms should affect patient care directly, but also result in the misallocation of limited funds for **respirator** usage. It is also important to emphasize that the risk for any particular patient will...

...provides a practical system that protects patients and employees.

HIGHEST-RISK PATIENTS

Isolation room and **respirator** are required. The **respirator** may be any type approved by NIOS H for TB use. Depending on the risk of TB and of MDR TB, HEPA and positive-pressure **respirators** may be considered. Patients in this group have newly diagnosed conditions that are untreated, having...

...having pulmonary TB, but sputum smear laboratory reports are pending.

HIGH RISK

Isolation room and **respirator** are required. Patients in this group include those who are smear positive and receiving effective...

...patient is clinically improved and cough frequency is reduced) and the requirement to use a **respirator** in the isolation room should be reviewed,

with the expectation that in most cases its...
...time. Such patients may remain in isolation rooms, depending on the level of suspicion, but **respirators** are not required. This situation is most applicable in geographic areas of low risk where drug resistance is uncommon. In geographic areas at high risk for TB and drug resistance, **respirator** use should be required longer, pending repeated or more aggressive diagnostic studies.
Low Risk
These...
...possible, but unlikely. These patients may or may not be placed in isolation, but a **respirator** is not required. This is most applicable to those areas of low risk where drug...ultraviolet radiation. NIOSH: Cincinnati, 1972; 1-5 [124] Hinds WC, Kraske G. Performance of dust **respirators** with facial seal leaks: I. Experimental. Am Ind Hyg Assoc J 1987; 48:836-41...
...694-99 [126] Chen CC, Lehtimaki M, Willeke K. Aerosol penetration through filtering facepieces and **respirator** cartridges. Am Ind Hyg Assoc J 1992; 53:566-74 [127] Chen CC, Ruuskanen J...
...129] Chen SK, Vesley D, Brosseau LM, et al. Evaluation of single-use masks and **respirators** for protection of health care workers against mycobacterial aerosols. Am J Infect Cont 1994; 22...Intern Med 1994; 120:964-65 [133] Jarvis WR, Bolyard EA, Bozzi CJ, et al. **Respirators** , recommendations, and regulations: the controversy surrounding protection of health care workers from tuberculosis. Ann Intern...
...Nettleman MD, Fredrickson M, Good NL, et al. Tuberculosis control strategies: the cost of particulate **respirators** . Ann Intern Med 1994; 121:37-40 [135] Adal KA, Anglim AM, Palumbo CL, et al. The use of high-efficiency particulate air-filter **respirators** to protect hospital workers from tuberculosis: a cost-effectiveness analysis. N Engl J Med 1994; 331:169-73 [136] Barnhart S, Beaudet N. **Respirators** and tuberculosis [letter]. Ann Intern Med 1995; 122:70 [137] Becket WS. **Respirators** and tuberculosis [letter]. Ann Intern Med 1995; 122:70 [138] Nettleman MD. **Respirators** and tuberculosis [letter]. Ann Intern Med 1995; 122:70-1 [139] Sobel E. HEPA **respirators** and tuberculosis in hospital workers [letter]. N Engl J Med 1994; 331:1658-59 [140] Sherertz RJ, Streed SA. HEPA **respirators** and tuberculosis in hospital workers [letter]. N Engl J Med 1994; 331:1659 [141] Brown V, Bishop C, Rutala WA, et al. HEPA **respirators** and tuberculosis in hospital workers [letter]. N Engl J Med 1994; 331:1659 [142] Adal KA, Anglim AM, Farr BM. HEPA **respirators** and tuberculosis in hospital workers [letter]. N Engl J Med 1994; 331:1659-60 [143...

11/3,AB,K/3 (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)

02834745 Supplier Number: 45747603
Determination of inspiratory pressures and flow rates for work rate-dependent quantitative respiratory fit testing
Canadian Occupational Health & Safety News, v18, n34, pN/A
August 28, 1995
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 285
Quantitative **respirator fit testing** is used to select **respirators** for individual workers and to gain insight into potential contaminant **leakage** . Current **fit test** exercises are designed to

primarily challenge the **respirator** face-piece-to-face seal. Inspiratory **pressure** across any break in the seal is also an important determinant of the amount of **leakage** through the break. **Fit tests** conducted at resting respiratory patterns may not be representative of **leakage** that occurs at respiratory patterns employed in the workplace. By design, the controlled negative **pressure fit test** method can control the driving force for **leakage** into a **respirator** by selecting a challenge **pressure** that represents actual use inspiratory pressures. In this study, mean inspiratory pressures and flow rates...
...at external work rates of 0, 180, 360 and 540 kg.m/ min. Effects of **mask** type and breathing resistance were determined using both half- **mask** and full-face **respirators** equipped with cartridges of relative low, medium and high breathing resistance. Inspiratory **pressure** was found to be strongly dependent on work rate and cartridge resistance. **Mask** type and gender also had significant effects on mean inspiratory **pressure** . Inspiratory flow rate was significantly affected by work rate and **mask** type. Data from the study can be used to conduct work rate-dependent **fit testing** with the controlled negative **pressure** method...

```
File 155:MEDLINE(R) 1966-2003/Aug W5
File   5:Biosis Previews(R) 1969-2003/Aug W4
File   6:NTIS 1964-2003/Aug W5
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Aug W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File  73:EMBASE 1974-2003/Aug W4
File 144:Pascal 1973-2003/Aug W4
File 440:Current Contents Search(R) 1990-2003/Sep 03
Set     Items   Description
S1         11   MASK()FIT(2W)PRESSURE
S2          5   RD (unique items)
S3          0   S2/2003
S4          1   S2/2002 [a duplicate]
S5          4   S2 NOT S4
```

5/6,K/1 (Item 1 from file: 155)

DIALOG(R)File 155:(c) format only 2003 The Dialog Corp. All rts. reserv.
10039540 21976666 PMID: 11980286

Follow-up and outcomes of nasal CPAP therapy in patients with sleep apnea syndrome.

Dec 2001

... hypertension. Side effects and compliance with CPAP are also influenced greatly by the adequacy of **mask fit** and **pressure** selection, which underlines the great importance of adequate technical expertise and patient education at the...

5/9/2 (Item 2 from file: 155)

DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
09843869 21655222 PMID: 11797024

Mask mechanics and leak dynamics during noninvasive pressure support ventilation: a bench study.

Schettino G P; Tucci M R; Sousa R; Valente Barbas C S; Passos Amato M B; Carvalho C R

Experimental Laboratory of Mechanical Ventilation, Respiratory ICU, Pulmonary Division, Hospital das Clinicas and Heart Institute, University of Sao Paulo Medical School, Sao Paulo, Brazil.

Intensive care medicine (United States) Dec 2001, 27 (12) p1887-91, ISSN 0342-4642 Journal Code: 7704851

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

OBJECTIVE: To study the mask mechanics and air leak dynamics during noninvasive pressure support ventilation. SETTING: Laboratory of a university hospital. DESIGN: A facial mask was connected to a mannequin head that was part of a mechanical respiratory system model. The **mask fit pressure** (P(mask-fit)) measured inside the mask's pneumatic cushion was adjusted to 25 cmH(2)O using elastic straps. Pressure support (PS) was set to ensure a maximal tidal volume distal to the mask (VT(distal)) but avoiding failure to cycle to exhalation. MEASUREMENTS: Airway pressure (P(aw)), P(**mask - fit**), mask occlusion **pressure** (P(mask-occl)=P(mask-fit)-P(aw)), VT proximal (VT(prox)), distal to the mask (VT(distal)), air leak volume (Leak=VT(prox)-VT(distal)), and inspiratory air leak flow rate (difference between inspiratory flow

proximal and distal to the mask) were recorded. RESULTS: PS 15 cmH(2)O was the highest level that could be used without failure to cycle to exhalation (VT(distal) of 585+/-4 ml, leak of 32+/-1 ml or 5.2+/-0.2% of VT(prox), and a minimum P(mask-occl) of 1.7+/-0.1 cmH(2)O). During PS 16 cmH(2)O the P(mask-occl) dropped to 1.1+/-0.1 cmH(2)O, and at this point all flow delivered by the ventilator leaked around the mask, preventing the inspiratory flow delivered by the ventilator from reaching the expiratory trigger threshold. CONCLUSION: P(mask-fit) and P(mask-occl) can be easily measured in pneumatic cushioned masks and the data obtained may be useful to guide **mask fit** and inspiratory **pressure** set during noninvasive positive pressure ventilation.

Tags: Human; Support, Non-U.S. Gov't

Descriptors: *Masks; *Positive-Pressure Respiration--instrumentation--IS ; Equipment Failure Analysis; Manikins; Respiratory Mechanics

Record Date Created: 20020117

Record Date Completed: 20020306

5/9/3 (Item 3 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

02715826 78144148 PMID: 637791 Record Identifier: 78144148

Effects of using long breathing hoses upon mask pressure.

Cooke J P; Olson R M; Maloney T M

Aviation, space, and environmental medicine (UNITED STATES) Feb 1978, 49 (2) p365-70, ISSN 0095-6562 Journal Code: 7501714

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Other Citation Owner: NASA

Record type: Completed

Subfile: INDEX MEDICUS

Effects of using oxygen breathing hoses from 0.9 to 8.2 m (3 to 27 ft) long and **mask fit** upon mask **pressure** during 0.75 to 12-s decompressions from 2,438 m (8,000 ft) to either 6,096, 10,668, or 15,240 m (20,000, 35,000 or 50,000 ft) were determined. Peak mask pressures and duration of high mask pressure were related to mask fit, mask and hose stretch compliance, pressure differential, decompression rate, and other factors, with mask pressure increasing with hose length. Peak mask pressures frequently exceeded 80 mm Hg, a high pressure associated with increased incidence of pulmonary damage. Cargo-type aircraft, however, have sufficiently large volumes so that they will not decompress rapidly enough to have high mask pressure, even with an 8.2-m long hose. Long breathing hoses should not be used in smaller aircraft since small cabin volume will result in rapid decompression rates and high mask pressure. Above a flight altitude of 2,438 m, oxygen should always be breathed if hoses longer than 2.9 m (9 ft) are used. This would help prevent hypoxia, associated with the need to deplete air in the hose before oxygen is breathed, should cabin pressure be lost at a high altitude. The fastest decompression rates compatible with preventing mask pressures from exceding 80 mm Hg during decompressions to different altitudes with different length breathing hoses are given.

Tags: Human

Descriptors: *Aerospace Medicine; *Masks; Aircraft; Decompression; Pressure

Record Date Created: 19780517

Record Date Completed: 19780517

File 16:Gale Group PROMT(R) 1990-2003/Sep 02
File 88:Gale Group Business A.R.T.S. 1976-2003/Sep 02
File 149:TGG Health&Wellness DB(SM) 1976-2003/Aug W3
File 180:Federal Register 1985-2003/Sep 02
File 624:McGraw-Hill Publications 1985-2003/Sep 02

Set	Items	Description
S1	7	MASK()FIT(2W)PRESSURE
S2	**5**	**RD (unique items)**
S3	0	S2/2003
S4	0	S2/2002

2/6,K/2 (Item 1 from file: 149)
DIALOG(R)File 149:(c) 2003 The Gale Group. All rts. reserv.
01909938 SUPPLIER NUMBER: 62495033 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Effects of Augmented Continuous Positive Airway Pressure Education and Support on Compliance and Outcome in a Chinese Population(*).
2000
WORD COUNT: 5207 LINE COUNT: 00440
... 1 month and 3 months to deal with any problem with the CPAP device or **mask fit** , and CPAP **pressure** was adjusted if necessary.
Augmented Support: In addition to the basic-support (BS) group, patients...

2/3,AB/3 (Item 1 from file: 180)
DIALOG(R)File 180:Federal Register
(c) 2003 format only The DIALOG Corp. All rts. reserv.
DIALOG Accession Number: 02442355 Supplier Number: 980100514
Respiratory Protection
Volume: 63 Issue: 5 Page: 1152
CITATION NUMBER: 63 FR 1152
Date: THURSDAY, JANUARY 8, 1998

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File 350:Derwent WPIX 1963-2003/UD,UM &UP=200355
File 347:JAPIO Oct 1976-2003/Apr(Updated 030804)
File 371:French Patents 1961-2002/BOPI 200209
Set     Items   Description
S1     180496   MASK? ?
S2      17916   RESPIRATOR OR RESPIRATORS OR VENTILATOR OR VENTILATORS OR -
             CPAP OR CONTINUOUS()POSITIVE()AIRWAY()PRESSURE
S3    1003949   FIT OR FITS OR FITTED OR FITTING
S4     631817   TEST OR TESTS OR TESTED OR TESTING
S5    1443335   PRESSURE
S6     222985   LEAK????
S7        645   IC=A61M-016/06
S8       3523   IC=A62B-007
S9       1695   IC=A62B-009
S10         6   S1 AND S3 AND S4 AND S5 AND S6
S11         2   S10 AND S7:S9
S12         4   S10 NOT S11

 11/34/1      (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003  Thomson Derwent. All rts. reserv.
015420071    **Image available**
WPI Acc No: 2003-482211/200345
  Nasal  mask  for delivering supply of gases to user, comprises engager
  including attachment portion able to be engaged with headgear strap, and
  slidingly engage headgear strap with patient interface
Patent Assignee: FISHER & PAYKEL HEALTHCARE LTD (FISH-N)
Inventor: GRADON L G; MCAULEY A E; MILIVOJEVIC I; NIGHTINGALE C E; SMITH N
  C A
Number of Countries: 101  Number of Patents: 001
Patent Family:
Patent No     Kind   Date    Applicat No    Kind   Date     Week
WO 200339637   A1  20030515  WO 2002NZ227    A   20021025  200345  B
Priority Applications (No Type Date): NZ 515257 A 20011105
Patent Details:
Patent No  Kind Lan Pg   Main IPC    Filing Notes
WO 200339637  A1 E  28 A61M-016/06
   Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA
   CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN
   IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ
   OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN
   YU ZA ZM ZW
   Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB
   GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW
Abstract (Basic): WO 200339637 A1
        NOVELTY - A nasal  mask  for delivering a supply of gases to a user
    comprises an engager (606, 607) adapted to slidingly engage a headgear
    strap (604, 605, 609, 611) with a patient interface.
        The engager comprises an attachment portion (608, 610) able to be
    engaged with the headgear strap
        DETAILED DESCRIPTION - A nasal  mask  comprises:
        (i) a patient interface in fluid communication with the supply of
    gases, when in use;
        (ii) headgear strap attached to or around the head of the user; and
        (iii) engager adapted to slidingly engage the headgear strap with
    the patient interface.
```

The engager comprises an attachment portion able to be engaged with the headgear strap. The engagement between the headgear strap and the engager is caused by the releasable engagement of a protrusion (612, 613), located on one of the attachment portion and the headgear strap, into a complementary shaped aperture (614, 615) located on one of the engager and the headgear strap.

An INDEPENDENT CLAIM is also included for a continuous positive airways **pressure** system, comprising:

(a) a pressurized source of gases;

(b) a transport mechanism in fluid communication with the pressurized source adapted to convey the gases; and

(c) a nasal **mask** in fluid communication with the transport mechanism.

USE - The nasal **mask** is used for delivering supply of gases to user, useful in continuous positive airways **pressure** system (claimed), used as therapy from obstructive sleep apnea.

ADVANTAGE - The invention is more comfortable for the user to wear and reduces the side **leakage** as compared with **masks** of the prior art.

DESCRIPTION OF DRAWING(S) - The draw shows a front view of a sliding strap with clipping attachment mechanism for use with the inventive nasal **mask** .

Slider (601)
First end (602)
Second end (603)
Headgear strap (604, 605, 609, 611)
Engager (606, 607)
Attachment portion (608, 610)
Protrusion (612, 613)
Complementary shaped aperture (614, 615)
pp; 28 DwgNo 6/9

Technology Focus:

TECHNOLOGY FOCUS - INSTRUMENTATION AND **TESTING** - Preferred Device: The patient interface is a nasal **mask** .

The nasal **mask** comprises a body portion having an inlet receiving the supply of gases; and sealer attached to or integrated with the body portion.

The sealer is adapted to seal against the facial contours of the user.

The engager is a slider (601) adapted to allow the headgear strap movement with respect to the nasal **mask** , while still providing compressive force on the sealer to ensure the supply of gases is delivered to the user without **leakage** . It comprises a restrainer(s) on the body portion, where in use, the slider is restrained in dimension(s), which can slide easily within other dimension(s) by the restrainer and can be easily disengaged.

The headgear strap is a strap having two ends, each having the protrusion.

The slider has a first end (602) and a second end (603), where the aperture is located in each of the first and second ends; and a section along it's length that is narrower in diameter than the rest of the sliders length, where the narrower section is easily fittable into the restrainer(s), to allow for the ease of **fitting** or removal of the slider within the restrainer(s).

The restrainer is vertically adjustable upon the body portion in a freely moveable manner or lockable in vertical position(s

Derwent Class: B07; P33

International Patent Class (Main): **A61M-016/06**

12/26,TI/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004229262
WPI Acc No: 1985-056141/198509
In vivo dermal absorption testing **of laboratory animal - uses head covering breathing** mask **supplied with air under** pressure

12/7,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013881759 **Image available**
WPI Acc No: 2001-365971/200138
Strapless respiratory facial mask **, has nose piece with central opening for gas supply adhered along cushioning layer of gasket**
Patent Assignee: BELFER W A (BELF-I); PETILLO P (PETI-I)
Inventor: BELFER W A; PETILLO P
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6196223	B1	20010306	US 9858437	A	19980410	200138	B
			US 99301876	A	19990429		

Priority Applications (No Type Date): US 99301876 A 19990429; US 9858437 A 19980410
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6196223	B1		25	A63B-018/08	CIP of application US 9858437

Abstract (Basic): US 6196223 B1

NOVELTY - A **mask** has a gasket (20) with a cushioning layer (22) and an adhesive layer (24). A triangular nose piece (60) whose central opening is connected to gas supply, is adhered along the edges of cushioning layer to form a peripheral seal. The central section of the nose piece includes an opening for connecting a tube (90) which supplies gas.

DETAILED DESCRIPTION - The central section of nose piece is shaped for receiving the wearer's nose. The tubular section includes an annular central opening for alignment with the opening (68) of the central section. The gas supply is connected to one end of the tubular section and check valves are mounted at the other end of the tubular section. The adhesive layer includes double-sided adhesive film, double-sided adhesive tape, **pressure** -sensitive adhesive, **pressure** -sensitive glue, **pressure** -sensitive gel or other adhering material. Peelable protective covering is provided for protecting skin attaching surface of adhesive layer. The peelable protective covering is made of paper, cellophane, polyvinyl chloride (PVC), aluminum foil, polyethylene (PE), teflon, silicone tapes, gels, plastic film or composites. The nose piece is made from thermoplastic material selected from the group consisting of ethylene vinyl acetate, methyl vinyl acetate, methyl acrylate, polypropylene, polyethylene, ELVAX, polytetrafluoroethylene resin, urethane, styrene, acrylic, Telfon, Sorbothane, carboxylate compound, or viscoelastic thermoset compound. The cushioning layer is selected from the group consisting of elastomeric compounds such as urethanes, polyvinylchloride foam, polytetrafluoroethylene foam, acrylic foam, polystyrene foam,

polyethylene foam, urethane foam, ethylvinyl acetate, silicones, rubber and/or neoprene.

An INDEPENDENT CLAIM is also included for strapless assembling and applying method which involves molding nose piece to custom **fit** the facial contours and skin of the person's face in preparation for adhering the laminated gasket. One or more sealing sections are trimmed to match the person's facial contours. The peelable protective covering is removed from the peripheral sealing section. The sealing sections of peripheral sealing is adhered to the person's facial contours and skin to obtain an airtight seal between moldable laminated gasket of **mask** and person's face. The nose piece is heated using hair blower and soaked in boiling hot water for 15-30 sec until the thermoplastic material is pliable. The rotatable respiratory hose is connected to the central opening (74) for expelling of carbon dioxide (CO2) gas out of facial **mask** when in use. A sub-nasal respiratory hose is connected to central opening for connecting to pressurized or non-pressurized gas supply in order to provide respiratory therapy to the wearer.

USE - For customizing to the wearer's face used in respiratory therapy, sleep medicine, anesthesia delivery, diagnostic **testing** , high altitude breathing, military, mining, chemical, metal fabrication and other industrial applications, occupational safety and fire fighting, laboratory procedures, woodworking, metal working, paint spraying and in any environments where dust and other air borne contaminants are present.

ADVANTAGE - The respiratory facial **mask** has the capability of being sealed tightly to the wearer's facial contours and skin without any skin trauma, irritation or inflammatory reaction to the skin surface. The **mask** receives pressurized or non-pressurized gases such as air, pure oxygen, anesthesia, steam-vapors, atomized or nebulized medicines without **leakage** of substances through the seal to the surroundings atmosphere or causing any decreases in gaseous **pressure** within the **mask** . The **mask** is simple and cheap. The **mask** is comfortable to wearer and gives aesthetically pleasing appearance when worn. The **mask** can be worn for a long period of time for diagnostic **testing** or medical treatment in order to achieve higher success rate of treatment by the user. The **mask** kit is assembled easily and man produced in automated and economical manner.

DESCRIPTION OF DRAWING(S) - The figure shows the exploded front view of strapless respiratory facial **mask** .

Moldably laminated gasket (20)
Cushioning layer (22)
Adhesive layer (34)
Nose piece (60)
Central section (62)
Opening (68)
Central opening (74)
Tube (90)
pp; 25 DwgNo 3A/16

Derwent Class: A96; P36
International Patent Class (Main): A63B-018/08

12/7,K/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

012540322 **Image available**
WPI Acc No: 1999-346428/199929

Sleep apnea positive airway pressure **treatment system with different applied** pressure **during exhalation and inhalation**

Patent Assignee: RESPIRONICS INC (RESP-N)
Inventor: CATTANO J M; ESTES M C
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5901704	A	19990511	US 91786269	A	19911101	199929 B
			US 93110372	A	19930823	
			US 96645110	A	19960513	

Priority Applications (No Type Date): US 93110372 A 19930823; US 91786269 A 19911101; US 96645110 A 19960513
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5901704	A			A61M-016/00	CIP of application US 91786269
					Div ex application US 93110372
					CIP of patent US 5239995
					Div ex patent US 5551418

Abstract (Basic): US 5901704 A

NOVELTY - A **pressure** transducer (138) provides a signal indicative of the instantaneous flow rate of air to the patient (12). This is compared with a time-averaged value of the airflow and, depending on whether it exceeds or is lower than the average value, a CPU (136) decides that inhalation or exhalation takes place and triggers the application of a high or low **pressure** accordingly (14, 26).

DETAILED DESCRIPTION - Before initiation of treatment, the apparatus will output a **leakage test pressure** (166) to temporarily overpressurize the gas flow circuit for a preset period of time, using a timer (170), during which the patient can **fit** the **mask** (22) to his face and adjust it to ensure minimum **leakage** .

The average **pressure** is slowly ramped up when therapy is initiated.

USE - For treatment of sleep apnea.

ADVANTAGE - By applying a lower **pressure** during exhalation (which requires less **pressure** that inhalation for preventing apnea), difficulties in exhaling caused by excessive **pressure** are reduced thereby increasing patient comfort. By minimizing unwanted system **leaks** prior to operation, the average system **pressure** can likewise be minimized, again increasing patient comfort. By ramping the **pressure** slowly when therapy is initiated, the patient's transition to sleep is eased.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic diagram of the system.

Patient (12)
Flow generator (14)
Pressure controller (26)
Mask (22)
CPU (136)
Pressure transducer (138)
Leakage test pressure controller (166)
Timer (170

Derwent Class: P34; S05; T01; T06
International Patent Class (Main): A61M-016/00

12/7,K/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX

001706365
WPI Acc No: 1977-E2852Y/197721
Apparatus for testing **gas** mask **for** leaks **- contains reversible pump,** pressure **gauge with stopcock and balloon**
Patent Assignee: AUERGESELLSCHAFT GMBH (AUER)
Number of Countries: 001 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2550594	A	19770518				197721	B
DE 2550594	B	19790613				197925	

Priority Applications (No Type Date): DE 2550594 A 19751107
Abstract (Basic): DE 2550594 A

The apparatus consists of a **pressure** gauge, to which two flexible hoses are **fitted** . One leads to a connector that **fits** the inlet valve of the gas **mask** to be **tested** , and the other leads to a reversible (**pressure** and suction) pump, preferably a rubber bulb.

The **pressure** gauge is **fitted** with a stopcock on the side nearer the pump.

The whole apparatus is mounted on a board which drops loosely into a box; the box has compartmented trays for tools and spares. The **tests** are made with the **mask** **fitted** over an inflated balloon; the hand pump **fits** the balloon and can be used to inflate it.

Derwent Class: P35; S02
International Patent Class (Additional): A62B-027/00; G01M-003/02

File 348:EUROPEAN PATENTS 1978-2003/Aug W04
File 349:PCT FULLTEXT 1979-2002/UB=20030828,UT=20030821

Set	Items	Description
S1	68219	MASK? ?
S2	8916	RESPIRATOR OR RESPIRATORS OR VENTILATOR OR VENTILATORS OR - CPAP OR CONTINUOUS()POSITIVE()AIRWAY()PRESSURE
S3	328693	FIT OR FITS OR FITTED OR FITTING
S4	431474	TEST OR TESTS OR TESTED OR TESTING
S5	526604	PRESSURE
S6	107812	LEAK????
S7	207	IC=A61M-016/06
S8	438	IC=A62B-007
S9	377	IC=A62B-009
S10	153	S1(S)S3(S)S4
S11	26812	S5(S)S6
S12	8	S10(S)S11
S13	**1**	**S12 AND S7:S9 [a duplicate]**
S14	**7**	**S12 NOT S13**

14/3,AB/1 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

00919450 **Image available**

CHARACTERISATION OF MASK SYSTEMS

CARACTERISATION DE SYSTEMES DE MASQUES RESPIRATOIRES

Patent Applicant/Assignee:
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WICKHAM Nicola Frances (executrix for the deceased inventor), 20 Hampden Road, Five Dock, New South Wales 2046, AU, AU (Residence), AU (Nationality), (Designated only for: US)
Inventor(s):
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Legal Representative:
DAVIDSON Geoffrey Robert (et al) (agent), Halford & Co., Level 7, 1 Market Street, Sydney, New South Wales 2000, AU,

Patent and Priority Information (Country, Number, Date):
Patent: WO 200253217 A1 20020711 (WO 0253217)
Application: WO 2001AU1673 20011224 (PCT/WO AU0101673)
Priority Application: US 2000258606 20001229
Designated States: AU JP US
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
Main International Patent Class: A61M-016/00
Publication Language: English
Filing Language: English
Fulltext Word Count: 10801

English Abstract
A method and a CPAP apparatus (10) for characterizing a plurality of different mask systems (14), e.g., masks and hoses, are provided. The CPAP apparatus (10) can be calibrated for different mask systems (14) and hoses (16) by including sensors (13,15) configured to measure flow and pressure at a flow generator (12) of the CPAP apparatus (10). When the flow generator (12) is fitted to a new mask system (14), or any changes are made to an existing mask system (14), mask or patient interface (34) and/or hose (16), a method of calibrating the flow generator (12) for the new mask system (14), mask (34) and/or hose (16) is provided. **The method**

includes determining air flow characteristics of the hose (16) using flow measurements made during a first test period when the flow through the mask system (14) is open, measuring or estimating pressure in the mask system (14) during a second test period when the flow through the mask system (14) is blocked and determining air flow characteristics of the diffuser (36) of the mask system (14) using the air flow characteristics of the air delivery hose (16) determined during the first test period and the pressure measurements made during the second test period.

Legal Status (Type, Date, Text)
Publication 20020711 A1 With international search report.
Examination 20020808 Request for preliminary examination prior to end of 19th month from priority date

14/7/2 (Item 2 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

00892561 **Image available**

BI-LEVEL FLOW GENERATOR

GENERATEUR DE DEBIT A DEUX NIVEAUX AVEC REGLAGE MANUEL DE DEPERDITION STANDARD

Patent Applicant/Assignee:
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HANSEN Gary L, 19085 Pheasant Circle, Eden Prairie, MN 55346, US,

Legal Representative:
REPPER George R (et al) (agent), Rothwell, Figg, Ernst & Manbeck, P.C., 1425 K Street, N.W., Suite 800, Washington, DC 20004, US,

Patent and Priority Information (Country, Number, Date):
Patent: WO 200226304 A2-A3 20020404 (WO 0226304)
Application: WO 2001US30456 20010928 (PCT/WO US0130456)
Priority Application: US 2000672955 20000929

Designated States: CA JP
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

Main International Patent Class: A61M-016/00
Publication Language: English
Filing Language: English
Fulltext Word Count: 4388

English Abstract
An apparatus for delivering a breathing gas to a patient includes a display, a storage device programmed to hold different purge hole leak profiles for a variety of mask types, and a selection mechanism for selecting one of the profiles so that accurate values of tidal volume, excess leak and peak flow may be calculated and shown on the display. The displayed excess leak value can be used to correct the fit of the mask.

Legal Status (Type, Date, Text)
Publication 20020404 A2 Without international search report and to be republished upon receipt of that report.
Examination 20020620 Request for preliminary examination prior to end of 19th month from priority date
Search Rpt 20020808 Late publication of international search report
Republication 20020808 A3 With international search report.
Search Rpt 20020808 Late publication of international search report

Correction 20030220 Corrected version of Pamphlet: pages 1/5-5/5, drawings, replaced by new pages 1/5-5/5; due to late transmittal by the receiving Office
Republication 20030220 A3 With international search report.
Claim
1 An apparatus for delivering a breathing gas to a
2 patient comprising
a blower that generates a flow of a breathing gas;
a gas flow rate sensor positioned to sense the flow of
5 breathing gas generated by said blower;
a memory device containing a plurality of purge hole leak
7 profiles corresponding to specific types of breathing
8 appliances;
means for selecting one of said plurality of purge hole leak profiles from said memory device; and
a microprocessor programmed to calculate at least one of excess leak, tidal volume, and peak flow using a flow rate measured by said gas flow rate sensor and the selected purge hole leak profile.
2 The apparatus of claim 1, further comprising a
2 display device in communication with said microprocessor, said
3 display device displaying at least one of the calculated
4 excess leak, tidal volume, and peak flow in response to a
5 signal generated by said microprocessor.
3 The apparatus of claim 2, further comprising an external communication port in communication with said microprocessor. - 17
4 The apparatus of claim 3,wherein said blower, said gas flow rate sensor, said memory device, said microprocessor, said display device, and said external communication port are part of a gas flow generating unit.
5 The apparatus of claim 4, further comprising a
2 computer, wherein said gas flow generating unit is connected to said computer via said external communication port.
6 The apparatus of claim 5, wherein said computer is programmed to display at least one of the calculated excess leak, tidal volume, and peak flow in response to a signal generated by said microprocessor.
7 The apparatus of claim 5, wherein said computer is programmed to permit selection of one of a plurality of purge hole leak profiles from said memory device.
8 The apparatus of claim 4, wherein said gas flow generating unit includes a console and wherein said selecting means includes at least one control on said console.
9 The apparatus of claim 1, wherein each purge hole leak profile is a mathematical function describing purge hole - 18
leak over a range of gas pressures for a specific type of mask.
10 The apparatus of claim 1, wherein each purge hole leak profile is a set of purge hole leak values corresponding to aset of gas pressure values for a specific type of mask.
I 11. A method for delivering a breathing gas to a user comprising the steps of
generating a flow of a breathing gas using a gas flow generator;

measuring the flow rate of the breathing gas;
selecting one of a plurality of purge hole leak profiles from a memory device; and
calculating at least one of excess leak, tidal volume, and peak flow using the measured flow rate and the selected 10 purge hole leak profile.
12 The method of claim 11, wherein said calculating step is performed by a microprocessor disposed within the gas flow generator.
13 The method of claim 11, wherein said calculating step is performed by a computer communicating with the gas flow generator via an external connection. 19
14 The method of claim 11, and further comprising, 2 after said calculating step, the step of displaying at least one of the calculated excess leak, tidal volume, and peak flow on a visual display device.
15 The method of claim 14, wherein said displaying step includes displaying at least one of the calculated excess leak, tidal volume, and peak flow on a display panel of the gas flow generator.
16 The method of claim 14, wherein said displaying step 2 includes displaying at least one of the calculated excess leak, tidal volume, and peak flow on a computer communicating with the gas flow generator via an external connection.
17 The method of claim 11, and further comprising the 2 steps of measuring gas pressure and determining a purge hole leak flow rate using the measured gas pressure.
18 The method of claim 11, and further comprising the step of retrieving the selected purge hole leak profile from a computer communicating with the gas flow generator via an external connection. - 20
. The method of claim 11, wherein each purge hole leak profile is a mathematical function describing purge hole leak over a range of gas pressures for a specific type of breathing appliance.
20 The method of claim 11, wherein each purge hole leak profile is a set of purge hole leak values corresponding to a set of gas pressure values for a specific type of breathing appliance...

14/3,AB/3 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
(c) 2003 WIPO/Univentio. All rts. reserv.
00753138 **Image available**
STACKABLE FILTER DEVICE
DISPOSITIF DE FILTRE EMPILABLE
Patent Applicant/Assignee:
VASE TECHNOLOGY, 250 Canal Street, Lawrence, MA 01840, US, US (Residence) , US (Nationality)
Inventor(s):
ESWARAPPA Muniyapla T, 2 McKenney Circle, Andover, MA 01810, US
Legal Representative:
RAGUSA Joseph W, Fitzpatrick, Cella, Harper & Scinto, 30 Rockefeller Plaza, New York, NY 10112-3801, US
Patent and Priority Information (Country, Number, Date):
Patent: WO 200066248 A1 20001109 (WO 0066248)

Application: WO 2000US11363 20000428 (PCT/WO US0011363)
Priority Application: US 99131834 19990429; US 99447131 19991122
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: B01D-046/24
International Patent Class: A62B-023/02; B01D-029/54
Publication Language: English
Filing Language: English
Fulltext Word Count: 8800
English Abstract

A stackable filter device for filtering an input to a source of suction comprises: a substantially hollow filter pad having first and second filter walls constructed of a filter material, the periphery of the first filter wall being sealingly engaged to the periphery of the second filter wall to form the filter pad, each of the filter walls having an aperture. The first and second filter walls each have an annular member fixedly contacted to the circumferential edge of the aperture. The annular members support the aperture, and are structured so as to integrally form connectors operable to removably connect the filter device to the source of suction or to an additional filter device on a first side of the filter device and to a sealing end cap or an additional filter device on a second side of the filter device. The filter device preferably includes a tubular stiffening member passing through the filter device. The stiffening member is rigidly attached at each end thereof to one of the annular members. The stiffening member comprises a perforated tubular shaft forming an air passage through the filter device.

Legal Status (Type, Date, Text)
Publication 20001109 A1 With international search report.
Publication 20001109 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
Examination 20010201 Request for preliminary examination prior to end of 19th month from priority date

14/3,AB/4 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
(c) 2003 WIPO/Univentio. All rts. reserv.
00464526 **Image available**
APPARATUS AND METHOD FOR ENHANCING COMFORT AND FOR FIT TESTING OF DISPOSABLE FACE MASKS
APPAREIL ET PROCEDE SERVANT A AMELIORER LE CONFORT ET A VERIFIER L'ETANCHEITE DE L'ADHERENCE DE MASQUES JETABLES
Patent Applicant/Assignee:
TECNOL MEDICAL PRODUCTS INC,
Inventor(s):
RUMMLER Joseph A,
BOWEN Michael L,
BRUNSON Kevin K,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9854991 A1 19981210

Application: WO 98US11418 19980603 (PCT/WO US9811418)
Priority Application: US 97869564 19970604
Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Main International Patent Class: A41D-013/00
Fulltext Word Count: 11337
English Abstract

A disposable face mask or disposable respirator including a filter body capable of filtering hazardous materials and/or dangerous airborne pathogens and forming a substantially fluid tight seal between the periphery of the respective face mask or respirator and adjacent portions of a wearer's face. Each disposable face mask or respirator having a filter body with a connector attached thereto and extending therefrom for use in coupling one end of a flexible hose with the respective face mask or respirator. The other end of the flexible hose may be attached to a source of vacuum or a source of low pressure air. For some applications, a single portable source may be used to apply either vacuum or positive low pressure air to the other end of the flexible hose. The connector, flexible hose and source of either vacuum or positive low pressure air improves the apparent breathability and comfort during extended periods of wearing the respective face mask or respirator.

14/3,AB/5 (Item 5 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00369699 **Image available**
RESPIRATOR HAVING THERMOCHROMIC FIT-INDICATING SEAL
RESPIRATEUR A JOINT INDICATEUR D'AJUSTAGE THERMOCHROMIQUE
Patent Applicant/Assignee:
MINNESOTA MINING AND MANUFACTURING COMPANY,
Inventor(s):
SPRINGETT James E,
BARRETT Leonard W,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9710027 A1 19970320
Application: WO 96US12711 19960805 (PCT/WO US9612711)
Priority Application: US 95526909 19950912
Designated States: AL AM AT AU AZ BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE HU IL IS JP KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN KE LS MW SD SZ UG AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Main International Patent Class: A62B-027/00
International Patent Class: G01M-03:04
Publication Language: English
Fulltext Word Count: 3823
English Abstract

Respirator (10) has a respirator body (11) that is configured to fit over the nose and mouth of a wearer. A thermochromic material (18) is positioned on the respirator body (11) such that the thermochromic material (18) makes thermal contact with the wearer's face when the respirator (10) is worn. The contact causes the thermochromic material

(18) to change color to allow the wearer to determine if a proper fit has been established.

14/7/7 (Item 7 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00138038
A NON-INVASIVE, QUANTITATIVE METHOD FOR FIT TESTING RESPIRATORS AND CORRESPONDING RESPIRATOR APPARATUS
METHODE QUANTITATIVE NON INVASIVE DE TEST ADAPTATIF DE MASQUES RESPIRATOIRES ET APPAREIL RESPIRATOIRE CORRESPONDANT
Patent Applicant/Assignee:
UNIVERSITY OF CINCINNATI,
Inventor(s):
WILLEKE Klaus,
Patent and Priority Information (Country, Number, Date):
Patent: WO 8702898 A1 19870521
Application: WO 86US2438 19861111 (PCT/WO US8602438)
Priority Application: US 85207 19851112
Designated States: AT AU BE CH DE FR GB IT JP LU NL SE
Main International Patent Class: A62B-027/00
Publication Language: English
Fulltext Word Count: 15218
English Abstract
A method and apparatus for conducting the method for non-invasive, quantitative respirator **fit testing** . The method includes the steps of having the wearer properly position the respirator over his nose and mouth, inhale to create a negative **pressure** inside the respirator cavity volume, hold his breath and record the **pressure** differential versus time decay rate between the **pressure** inside the respirator cavity volume and that of the surrounding environment. The method may also include establishing a **leakhole** of known dimension, repeating the above steps and determining the volume of the respirator cavity based upon the results of the recorded differential **pressure** versus time by comparing the result to calibration curves. The apparatus of the present invention includes modifying a conventional face **mask** respirator by providing the respirator with a **pressure** sensor and a **leakhole** of known dimension. Preferably, the apparatus can also include a calculator to continuously calculate a quantitative factor to indicate the degree of protection, which is based upon the volume of the respirator cavity divided by the volumetric flow rate through the **leakhole** or holds of unknown dimension and location for a standard unit of time, given an initial negative **pressure** in the respirator cavity.
Claim
1 In a face mask respirator for use in a hazardous air environment, said respirator having an air inlet and an air outlet and forming a respirator cavity volume when. In the face mask respirator of claim 1, wherein said aperture comprises a tube of known dimensions, said tube being molded into said face mask respirator...

3 In the face mask respirator of claim 1, wherein said means to open and close said aperture is a flow control valve.

4 In the face mask respirator of claim 1, wherein said means for sensing comprises a tube molded into the said face mask respirator, and a pressure sensor coupled to said tube.

5 In the face mask respirator of claim 1, wherein said means for sensing comprises a pressure sensor securely mounted on said face mask respirator, an

opening being fluidly coupled to said pressure sensor, said @opening terminating within said respirator cavity volume.

6 In the face mask respirator of claim 1, further .comprising a canister having an internal volume, said canister being secured to said face mask respirator over I and about said air inlet whereby said internal volume of said canister is in communication with said respirator cavity volume.

7 In the face mask respirator of claim 6, wherein said aperture comprises a tube molded into said canister, said tube having known internal dimensions.

8 In the face mask respirator of claim 7, wherein said means for sensing comprises a hole molded into said canister, and a pressure sensor coupled with said hole whereby said pressure sensor can measure the pressure in the respirator cavity volume by measuring the pressure in said canister.

9 In the face mask respirator of claim 1, further comprising means to record the pressure within said respirator cavity volume with time, said means to record being coupled with means for sensing.

10 In the face mask respirator of claim 9, said means to record being mounted on said face mask respirator.

11 In the face mask respirator of claim 9, wherein said means to record comprises a strip chart.

12* In the face mask respirator of claim 117 wherein said strip chart is mounted on said face mask respirator and is alogarithmic strip chart.

13 In the face mask respirator of claim 1, said means to sense includes a signal means to inform the wearer when the fit of said face mask respirator is insufficient.

14a In the f ace mask res pi ra to r of claim 13, wherein said signal is an audible signal.

15a A canister for testing the degree of fit between a conventional face mask respirator and the face of a wearer, said canister comprising a hollow member, a first portion of said hollow member having an opening therein, said opening designed to be in communication with an air inlet opening of a conventional face mask respirator, and a second portion of said hollow member, said second portion having an aperture of known dimensions, and a means for sensing the pressure within said hollow member.

16 The canister of claim 15, wherein said second portion further includes a second aperture having dimensions sufficient to permit normal breathing when said canister is attached to said face mask respirator.

17 The canister of claim 16, wherein each of said aperture of known dimensions and said second aperture include means to open and close said apertures,

18 The canister of claim 17, wherein said means to. open and close comprises flow control valves.

19 The canister of claim 15, wherein said means to sense the pressure comprises a third aperture and a remote pressure sensor fluidly coupled to said aperture,

20 The canister of claim 15, wherein said means to sense the pressure comprises a third aperture and a pressure sensor fluidly coupled to said third aperture, said pressure sensor securely fastened to said canister.

2 1 The canister of claim 15, wherein said means to sense the pressure includes means to record the pressure with time.

22 The canister of claim 21, wherein said means to sense also includes a pressure sensor indicating the pressure within said hollow member, said pressure sensor being molded on said canister so as to be readable by the wearer.

23 A face **mask** respirator for use in a hazardous air environment, said respirator comprising a cup-like member having resilient edges and adapted to **fit** over the face of a wearer forming a respirator cavity volume between the

face of a wearer and the cup-like member, said cup-like member including an exhalation valve, an inhalation valve, an air purifying canister designed to be in communication with said inhalation valve, said air purifying canister having means to secure or remove it from said cup-like member, and a **test** canister, said **test** canister having means to secure or remove it from said cup-like member, the **test** canister having means to sense the **pressure** in said respirator cavity volume, and a **leakhole** of known dimensions, whereby when it is desired to **test** said face **mask** respirator, said air purifying canister is removed from said cup@like member and replaced with said canister.

24 A non-invasive, quantitative method for fit testing a face mask respirator based upon the pressure and volume in the respirator cavity volume, comprising:

1) donning a respirator;
2) sealing all known inlets into the respirator cavity volume of said face mask respirator;
3) creating a negative pressure within the respirator cavity volume;
4) recording the pressure within the respirator cavity volume with time;
5) determining a quantitative factor based upon the press-ure and volume within said respirator cavity volume for a specific period o time to in'dicatge the degree of protection the face mask respirator provides the wearer.

25 The method of claim 24, wherein the step of To sealing comprises covering all known inlets with the palms of the wearer's hands.

26 The method of claim 24, wherein the step of sealing comprises replacing at least one of the air is purifying canister with a test canister.

27 The method of claim 26, wherein the step of sealing further comprises replacing the cemaining air purifying canisters with sealed canisters whereby the interior of said sealed canister is exclusive of the respirator cavity volume.

28 The method of claim 24, wherein the step of creating a negative pressure within the respirator cavity 2.5 volume includes inhaling by the wearer to obtain the negative pressure.

29 The method of claim 24, wherein the step of recording the pressure within the respirator cavity volume with time includes recording the pressure and time on a strip-chart.

30 The method of claim 24, wherein the step of determining the fit factor includes determining the volume of the respirator cavity by leaking air into the respirator cavity through a leakhole of known dimensions.

L. 31* The method of claim 30, wherein the step of determining the volume of the respirator cavity includes comparing the slope of the graph of the pressure versus time of the leakhole of known dimensions with a series of slopes of known vo lume s o n a calibration graph t o determine the volume of said respirator cavity.

32. The method of claim 24, wherein said respirator is an air supplied respirator. LO

33 The method of claim 24, wherein said respirator is selected from the class comprising a half-mask respirator, a quarter-mask respirator, a full respirator and a helmet-hood respirators is

34 The method of claim 24, wherein the step of determining a quantitative factor includes an alarm means whereby when said quantitative factor is below a predetermined quantity, said alarm means is activated.

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Brion LP / Primhak RA, Jan 2002
...only reduce lung compliance (and thus tidal volume if using a **pressure**-limited ventilator) but also increase airway resistance by...pulmonary shunt in the absence of any change in wedge or oncotic **pressure** (as described in oleic acid-induced pulmonary edema) (Ali 1979...
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Ian D Caterson, Nov 2002

...gives a reasonable estimate of adiposity. At the extremes of age or in the very **fit** and muscular it is not as accurate. The National Health & Medical Research Council... [http://members.iinet.net.au/~aacb/pubs/cbr_obes.html]
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Stradling, J., *The Lancet*, Jan 1997
...nasal continuous positive-airway **pressure** (**CPAP**), made investigation of the symptoms...despite the insensitivity of the **test** used to measure this symptom. Clinicians and researchers believe that **CPAP** treatment is appropriate for symptomatic...
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Neuromuscular Disorders, May 1998
...retarded. In Italy and the UK, the orthopedic intervention to **fit** the orthoses is kept at a minimum and is mainly done by...free from secretions such as continuous positive airway **pressure** (**CPAP**). She also should teach the parents assisted coughing...
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☐ **6.** Pulmonary dysfunction and its management in post-polio patients
Bach, J.R. / Tilton, M., *Neurorehabilitation*, Mar 1997
...oxygen and continuous positive airway **pressure** (**CPAP**) approaches are taken. It is hard...least 3 or 4 commercially available **CPAP** masks as interfaces for IPPV to determine the ones which best optimize **fit**, seal, and comfort. If none are adequate...
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Twersky, R.S., *Ambulatory Surgery*, May 1997
...tests, as the specificity and sensitiv- ity of the laboratory **test** varies. resulting in false posi- tives and negatives. In the...More pa- tients within the abnormal preoperatis-e coagulation **test** groups had more operations postponed and more additional tests...
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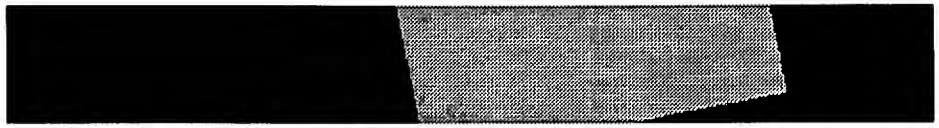

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Brewer, Gregory Newton / Colla, Gregory Alan / Farrugia, Steven Paul / Somaiya, Chinmayee, Jul 2002
...the functional mode is a manual mode, then the **mask-fit test pressure** is the current `set` pressure. If the functional mode is the automatic titration mode, the **mask-fit test pressure** is the 95.sup.th percentile pressure of the previous...
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...a controller having a control of said flow generator and programmed to cause a **mask-fit test pressure** to be applied at the mask, said test pressure being determined as a percentile...
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...projects, which can aid in attaining better and, from a long-**range** viewpoint, more economical paint jobs. 2. Applicablity. This...Maintenance Painting Approaches . . . . . 6-5 6-3 Application of **Test** Patches of Coating Materials . . . . . 6...
[http://www.usace.army.mil/inet/information/usace-docs/...]
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Oct 2000
...barriers. Currently, PPE consists of a **mask**, special over- garments, and gloves and...**mask** (the joint service general purpose **mask** [JSGPM]) will allow for better peripheral...perform a Valsalva maneuver to equalize **pressure** in their ears). A joint service lightweight...
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...or the M-41 Protection Assessment **Test** System (PATS) is required to determine proper

fit. Proper **mask** size will be determined upon issue...and the outsert removed) you can **fit** the **mask** as follows: AFH 32-4014, Volume...
[http://www.afrc.af.mil/AFEPLTEMP/STDPUBS2/pubs/af/32/a...]
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...the reported symptoms. More recent studies have been expanded to cover the whole **range** of CB defense, from medical issues to materiel development to doctrine and training...
[http://www.nap.edu/readingroom/books/protect_forces/]
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...core isolation cooling, high **pressure** coolant injection, control rod...procedures and surveillance **test** results: 2 + 2.2.28 Dry Chemical...ultrasonic tests performed on high **pressure** coolant injection (HPCI) system...radiographic examination and **test** results of butt welds 10R2...
[http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/REPORTS/pilg_2...]
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Feb 2002
...simulant is conducted to measure any aerosol **leakage** into the suit. During the **test**, the people in the suits are moving in ways...simulant) vapor, is used to measure any vapor **leakage** into the suit. This **test** was conducted on six suits Â one from each...
[http://www.chem-bio.com/resource/dp_levela_executive_r...]
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☐ **7.** 001-15
Oct 2000
...critical problem. The **leakage** can be attributed to...face, and (2) improper **fit**. Recommendation. Additional...research is needed on **mask** seals and **mask fit**...should deploy the M41 **Mask Fit Test** kit more widely. Finding. **Leakage** around closures in personal...
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